

# THE IRON AGE

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IRON AGE PUBLISHING CO.  
 239 West 39th Street,  
 New York, N. Y.

Cable Address: "Ironage, N. Y."

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Division of  
 UNITED BUSINESS PUBLISHERS, INC.  
 New York, N. Y.

*District Offices:*  
 CHICAGO, Otis Building  
 PITTSBURGH, 1319 Park Building  
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 Member, Audit Bureau of Circulations  
 Member, Associated Business Papers  
 Published every Thursday. Subscription Price: United States and Possessions, Mexico, Cuba, \$6.00; Canada, \$8.50; foreign, \$12.00 a year. Single Copy 25 cents.

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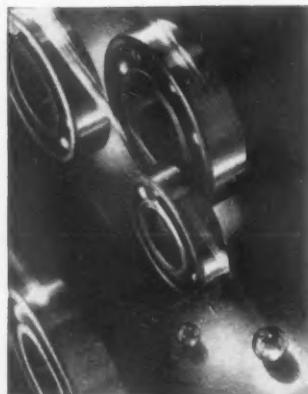
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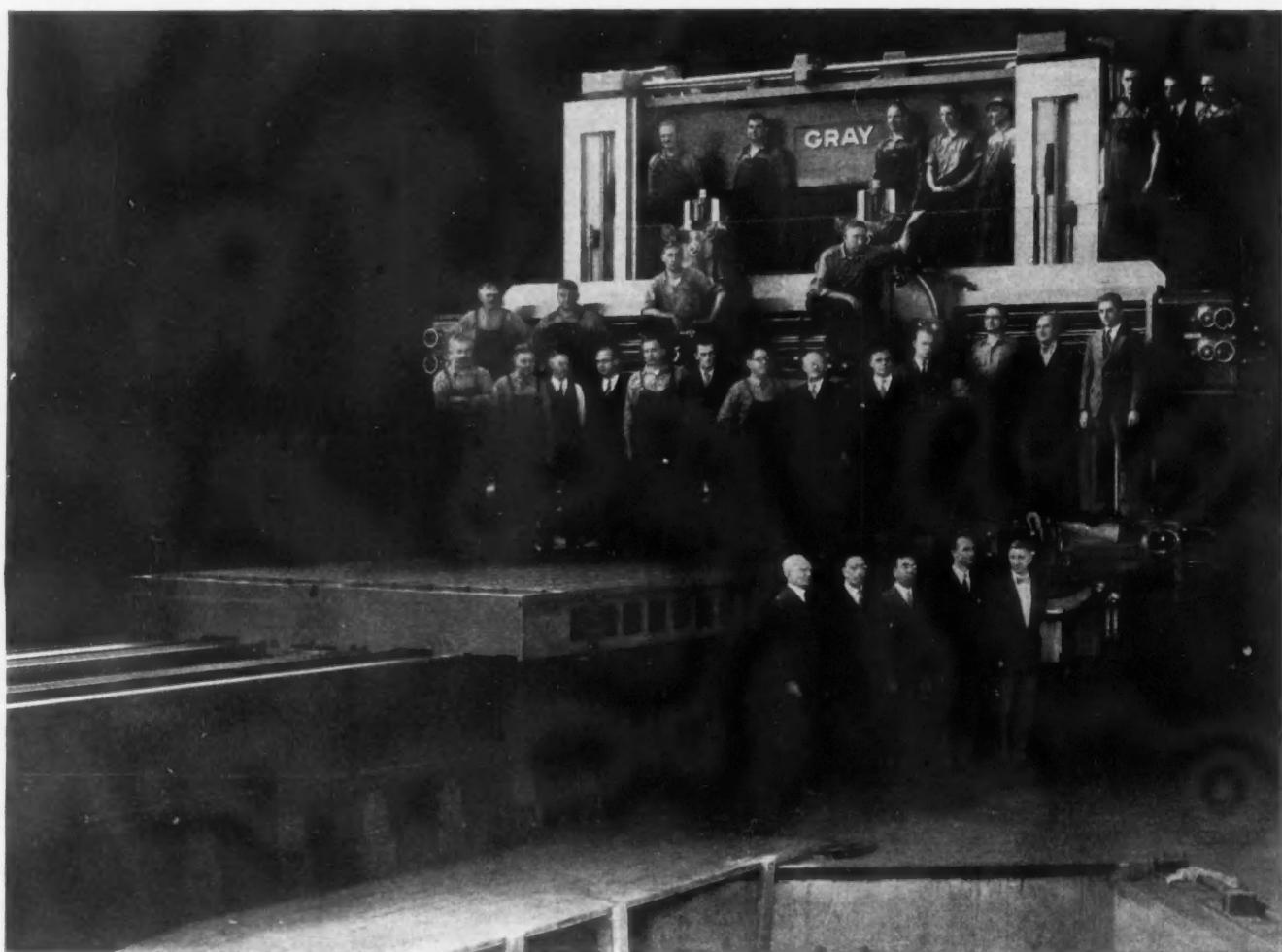
76<sup>th</sup>  
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 YEAR



# THE WORLD'S LARGEST HIGH SPEED PLANER

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The G. A. Gray Company, of Cincinnati, has just completed this 500,000 pound planer, probably the largest modern machine tool in the world. A generous use of anti-friction bearings —



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1660

### NEW DEPARTURE BALL BEARINGS

# THIS ISSUE IN BRIEF

January 8, 1931

## Needless Waste in Forging

The specifying of non-essential limits causes the scrapping of good drop forgings. The purchaser pays the bill.—Page 152.

\* \* \*

## Will Tungsten Carbide Bring About a Spectacular Development?

Use of machined products will be greatly increased by ability to machine metals three times as fast as before, machine tool builder predicts. Prices will be cut, resulting in much wider distribution.—Page 155.

\* \* \*

## "Direct Process" Beneficiates Iron Ore

Low-content iron ores, put through the sponge iron process, can be made suitable for charging directly into the open-hearth. If charged into the blast furnace they improve furnace operation.—Page 162.

\* \* \*

## Carburizing Boxes Emptied on Revolving Screen

The parts rotate on cone-shaped screen until all traces of carburizing compound and steel dust are removed. Then they are discharged from the small end into tote pans.—Page 173.

\* \* \*

## Flood Reservoirs Useful in Drought

Impounding reservoirs, employed for flood control, can be used to maintain navigation during low water.—Page 149.

\* \* \*

## The Cobbler's Children

Machine-tool builders themselves are the worst offenders in the use of obsolete equipment, says machine-tool builder. Their plants are full of ancient tools.—Page 157.

\* \* \*

## Heat-treating Costs Cut

Electric furnace installation enables roller bearing manufacturer to handle, in doubled space, five times the volume of work formerly done, and at a lower cost.—Page 172.

\* \* \*

## Saving Costs by Short Travel

Material in stamping plant moves from receiving track straight across building to shipping platform, being processed in transit. Presses are grouped to minimize movement of pieces passing through.—Page 165.

\* \* \*

## River Shipment of Steel Gains Rapidly

Even with declining steel production, over two million tons of iron and steel was shipped on the Ohio, Monongahela and Allegheny rivers in 11 months ended Nov. 30.—Page 151.

\* \* \*

## How to Cut Forging Costs

Pronounced changes in shape will cause variations in flash and in the forging that may induce warping during hot trimming. A slightly increased allowance for machining surfaces will save expensive re-striking.—Page 153.

\* \* \*

## Pressing Without Leaving Marks

By putting pressure of punch on inside of radiator shell, the outside is left free of scratches and ready for plating.—Page 168.

## "Unbalanced" Dies Cause Hammer Trouble

When a change in forging section is not balanced by a similar change in the opposite direction, there is a "pull" when the hammer strikes that tends to throw the dies out of parallel.—Page 152.

\* \* \*

## Don't Stop Super-hard Tools in the Cut

A good mechanic seldom does this, but it happens often enough to ruin many expensive tools in the course of a month.—Page 156.

\* \* \*

## Price-hammering Endangers Dividends

Unless producers can get fair prices, dividends will be curtailed and wages will be forced down, resulting in diminished purchasing power.—Page 169.

\* \* \*

## New Cutting Tools Will Revolutionize Industry

To get the maximum benefit from tungsten carbide, we must be prepared to scrap not only cutting tools, but jigs and fixtures, machine tools, production lines, and even entire factories.—Page 157.

\* \* \*

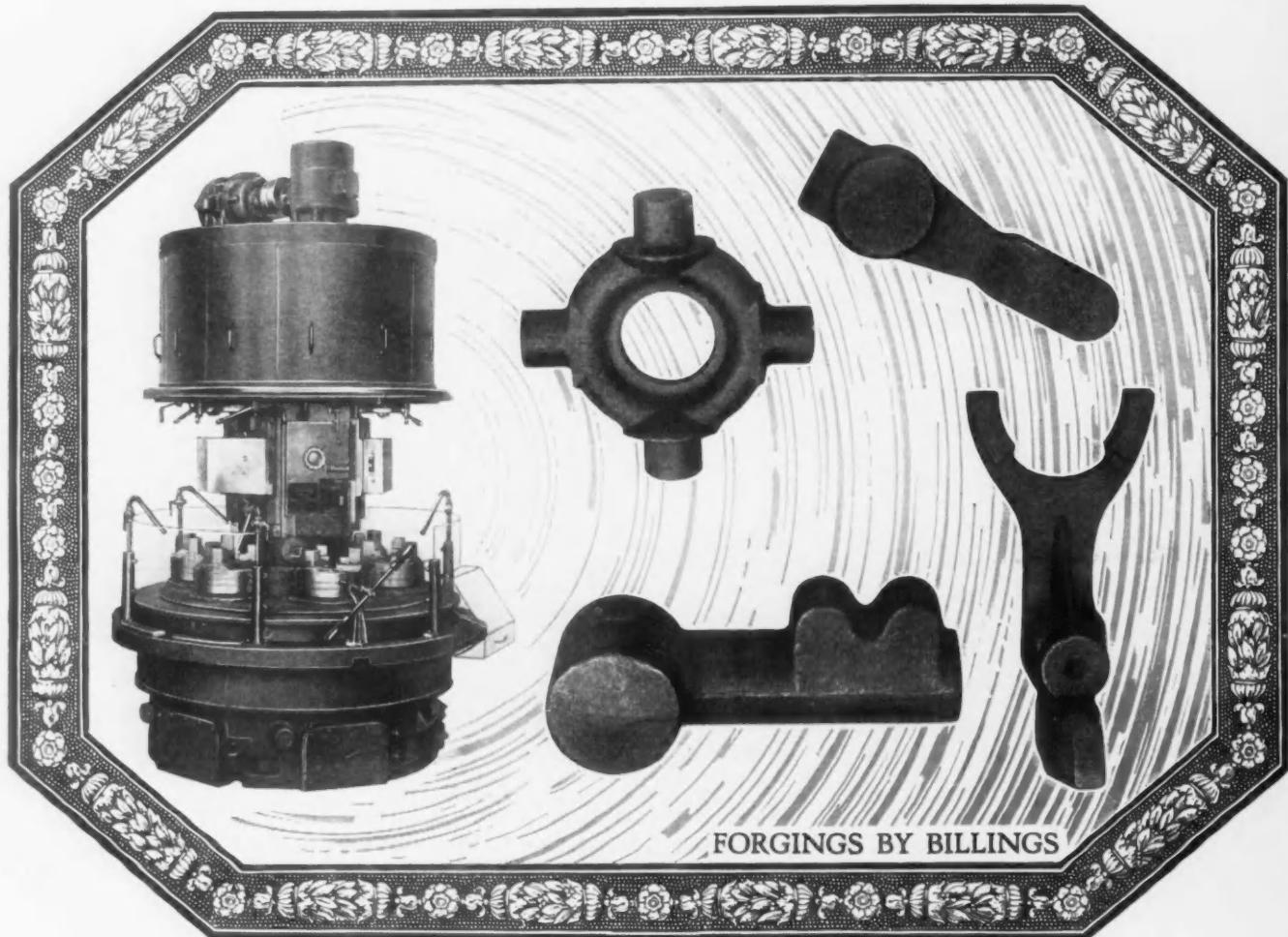
## Steel Jobbers Abandon Speculative Buying

Warehouse industry is concentrating on selling and distributing; speculative buying seems definitely to have disappeared.—Page 171.

## NEXT WEEK

How new forces are pulling the factory away from the city will be discussed by A. W. Robertson, chairman, Westinghouse Electric & Mfg. Co.

All-steel windowless building construction, more reliable methods of determining carbon in rustless steels and tonnage melting in coreless induction furnaces will also be features.



## In BULLARD "Mult-Au-Matics"

### *Billings Forgings Support a Basic Principle*

IN its Fiftieth Anniversary Greeting Card, The Bullard Company of Bridgeport, Connecticut says: "The basic motive upon which this company was founded, was to make the best possible equipment for the job. . ." The metal-working world knows how this motive has materialized in versatile "Mult-Au-Matics" and vertical turret lathes; in BULLARD capacity for sustained high production, Billings forgings contributing. Bullard machines, Billings forgings have qualities in common, but the qualities are not common. May we show your engineers recent developments in close-tolerance forgings with the new "semi-machined" finish—which saves so substantially on machining-costs?

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# THE IRON AGE

New York, January 8, 1931

ESTABLISHED 1855

VOL. 127, No. 2

## INLAND WATERWAYS DEVELOPMENT BROADENS, ALSO THEIR USE

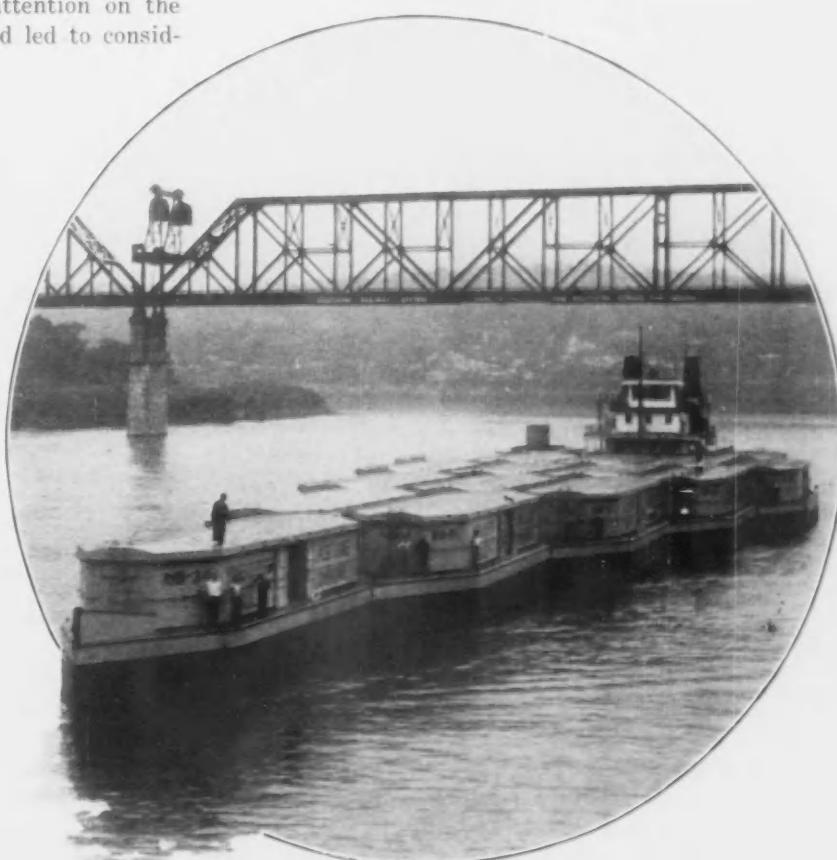
**D**EVELOPMENT of inland waterways, with particular emphasis on the movement of steel products and fuels in and out of the Pittsburgh district, went forward without abatement during 1930, with the usual increases in terminal facilities as well as in new equipment for the transportation of raw and finished materials by water.

Completion of the Ohio River canalization project late in the preceding year focused attention on the possibilities of river improvement and led to considerable prospective development. Along this line the most important single project was the Ohio River-Great Lakes waterway, which has reached a point at which Government approval may be expected within the next year. Another development of the year, the ultimate importance of which can not be minimized, was the demonstration of the flood control offered by the maintenance of navigable water on the Monongahela River during the serious summer drought by means of the Cheat River power conservation project.

### Flood Control Possibilities

The Pittsburgh Flood Commission has long advanced the theory that flood control, as well as the maintenance of uninterrupted navigation on the rivers, could be accomplished by the construction of a series of impounding reservoirs and power dams on certain key rivers. During the drought of the summer the water level of the

Monongahela River reached such a low point that navigation could not have been continued had not water from the Cheat River reservoir, originally constructed for power service, been fed into the river at regular intervals. Interruption of navigation on this river, by means of which most of the important industries of the Pittsburgh district receive their coal and



coke, would have had very serious results. A similar project is now under consideration for the Allegheny River, by means of the construction of three dams on the Clarion River, which would create an artificial lake 50 miles long. The two projects would capture the entire flow of two important tributaries of the Monongahela and Allegheny Rivers, and feed out the water at a steady rate over the entire year. The importance of such a development to navigation on the upper Ohio River is self-evident, and last summer's demonstration of the usefulness of these improvements has considerably strengthened the value of the Flood Commission's work with the Federal Government.

#### *Ohio River—Lake Erie Canal*

CANALIZATION work on the various tributaries of the Ohio River during 1930 was not of a major character. Dredging operations were carried on steadily in the Ohio River in an effort to maintain the 9-ft. stage required by navigation, but drought conditions allowed the water level to fall considerably below this figure over an extended period. With a

normal flow of water, dredging in the future will not be required on such a large scale. Canalization of the Youghiogheny River as far as West Newton, Pa., was authorized and will be undertaken immediately. Potential shippers in the Kiskiminetas and Conemaugh valleys succeeded in securing authorization for a survey of these rivers, looking to the future construction of locks and dams. Both rivers would contribute important tonnages of steel.

The Lake Erie-Ohio River canal by way of the Beaver and Mahoning rivers was given considerable impetus in November when the Pittsburgh Chamber of Commerce joined with the Beaver, Mahoning and Shenango Rivers' Improvement Association, of Youngstown, in its advocacy. The project won the approval of the Mississippi Valley Association, meeting in St. Louis, and later received the endorsement of the United States Rivers and Harbors Commission at Washington. Authorization of a survey of the proposed route, extending from the Ohio River up the Beaver River to Mahoningtown, Pa., thence along the Mahoning River, and from the Mahoning by way of a canal to a point near Ashtabula, Ohio, now seems imminent.

Interest of Pittsburgh shippers in the project is confined entirely to its extension by canal to Lake Erie, which would eventually permit the shipment of iron ore by barge from Lake Erie to Pittsburgh district blast furnaces. While Valley shippers are also

interested in this movement, their primary consideration is the opening of the Youngstown district to river shipments on the Ohio. This would not only provide Valley mills with considerable reductions in freight rates on coal from western Pennsylvania fields, which they have long sought from the railroads, but would also place Youngstown manufacturers on an equal basis with Pittsburgh in shipping finished steel products by water into the Mississippi Valley.

The object of the Beaver, Mahoning and Shenango

Rivers' Improvement Association is the improvement of these three rivers for slack water navigation, and its first objective is a bill already introduced into Congress, providing for the examination and surveys of the rivers. The bill does not contemplate a canal, but only the widening, deepening and slack watering of the existing streams by the construction of probably five locks and dams on the Beaver and Mahoning rivers and three on the Shenango. The association believes

that the facts rendering

the tri-river improvement necessary are the

complete canalization of

the Ohio and the Monon-

gahela rivers; the large increase in freight rates on coal, coke and other steel-making materials since 1914, and the change from the use of Connellsville beehive coke in blast furnaces to by-product coke, made principally at the furnaces from coking coal. It is estimated that the total movement per year available for the improved rivers from Beaver, Pa., to Niles, Ohio, would be approximately 14,200,000 tons, while, if the improvement were carried to Warren, Ohio, and to the Pennsylvania steel centers on the Shenango River, nearly 10,000,000 tons would be added. Even though the construction of a canal through to Lake Erie may possibly be delayed because of the high cost and also the opposition of conflicting groups, it is believed in steel circles that the Beaver-Mahoning-Shenango project will go forward immediately.

#### *River Steel Tonnage Gained*

PROTEST against the Youngstown route for a river-lake canal has already been entered by the Oil City, Pa., Chamber of Commerce, which advocates a canal extending from Franklin, Pa., along French Creek to the lake. While this route is somewhat farther, less actual digging would be required. Interests at Portsmouth, Ohio, also advocate a route extending up the Scioto River and generally following a water route from the river to Lake Erie, which was in existence before the days of railroads.

Total tonnage of iron and steel products handled

on the Ohio, Monongahela and Allegheny rivers, within the jurisdiction of the Pittsburgh office of the United States Corps of Engineers, in the 11 months ended Nov. 30, 1930, was 2,318,756 tons. This was an increase over the 2,279,904 tons moved in the corresponding 1929 period, despite the sharp decline in steel production. Of the 1930 tonnage, the Ohio River contributed 1,186,503 net tons, the Monongahela 1,091,978 tons, and the Allegheny 40,275 tons. These figures are for both up and down river shipments, and include a large tonnage of inter-plant materials.

The gain in shipments in the past year in spite of depressed business conditions may be attributed in large measure to the normal expansion in river shipments, which seems to continue in spite of outside influences. Increases in short haul railroad freight rates in the Pittsburgh district also diverted considerable inter-plant steel tonnage to the rivers, which had heretofore been carried by rail.

The sharp gain in iron and steel tonnage moved on the Allegheny River—from 2107 tons in the first 11 months of 1929 to 40,275 tons in the corresponding 1930 period—is largely attributable to shipments of pig iron to the Allegheny Steel Co. from producers located down the Ohio River. The Allegheny company installed unloading facilities at Brackenridge, Pa., during the year, and may be expected to use the rivers in the future for this purpose.

While no estimates of river shipments by products are available, the largest gains this year were undoubtedly accounted for by line pipe. Pittsburgh district plants contributed heavily to this tonnage, but some material was also moved by rail from Valley mills to Ohio River docks for reshipment by water. Steel companies using the rivers in the Pittsburgh area include Carnegie Steel Co., Jones & Laughlin Steel Corp., Pittsburgh Steel Co., Wheeling Steel Corp., Spang, Chalfant & Co., Weirton Steel Co., and Allegheny Steel Co. Other smaller companies continue to utilize barge service for delivery of raw materials.

In April, the Jones & Laughlin company dispatched its 100th tow of steel products down the Ohio River, and next year it may inaugurate more frequent shipments than heretofore undertaken. During the year a shipment of steel products from the Pittsburgh district was towed as far as Rock Island, Ill., on the Mississippi River, and another tow went down the Mississippi and through the Gulf of Mexico to Biloxi, Miss.

#### *Terminal Construction Active*

SEVERAL terminal projects were completed or undertaken during 1930. Pittsburgh shippers advocate the construction of two terminals, one for package freight and the other for carload movement. The package terminal at Manchester, North Side, Pittsburgh, involves improvement of existing facilities and seems to be definitely assured for the coming year. The site advocated at Hays Station for bulk shipment is more indefinite, as the railroads serving the terminal have their own river shipment facilities, and many shippers doubt its real need. Terminals in the Pittsburgh area completed include three railroad installations, one for the Baltimore & Ohio at Glenwood, Pa., for rail to river transfer, another for the Pennsylvania at Conway, and another for the Pittsburgh & Lake Erie at

Monaca for river to rail movement. The Standard Oil Co. of Pennsylvania also completed a terminal at Midland, Pa., while the Gulf Refining Co. added terminal facilities at Neville Island, Pittsburgh, and Louisville. The American Barge Line Co. also completed a terminal at Louisville, Evansville, Ind., completed a municipal development, and municipal terminals were also completed at Rock Island, Ill., and Helena, Ark.

Outstanding among the new companies organized for river commerce during the year was the Mississippi Valley Barge Line Co., with headquarters at St. Louis and Cincinnati. This company erected a freight

(Continued on page 176)



UNIFLOW steam-driven towboat Ohio of the Mississippi Valley Barge Line Co. pushing a tow of 17 barges on the Ohio River at Cincinnati. This company now has weekly barge service to New Orleans. These barges are built so that they dovetail when placed together in one tow.

# Definite Drop-Forging Tolerances Will Aid in Lowering Costs

By EUGENE C. CLARKE

**T**O profitably produce identical forms of maximum strength combined with minimum weight is the fundamental objective of the drop forge industry. These forms or forgings are essential in the application of "mass production" to manufactured articles, and the increase in the use of drop forgings is in approximately direct proportion to the development of interchangeability of parts.

With "interchangeable production" has come an improvement in quality of products in accuracy of finished surfaces and fits and in gaging devices to detect variations in thousandths of an inch. It is logical, therefore, that the specifications for drop forgings have demanded closer and closer tolerances with regard to their size, structure and weight.

The producers of drop forgings have exercised amazing ingenuity in meeting these demands by greatly improving their methods, adopting modern equipment, establishing more frequent inspection in process, etc., and in doing so are contributing to general progress by finding means of accomplishing these objectives at the same or even lower costs than formerly prevailed.

However, there is a definite economic need for the establishment of commercial tolerances that can be specified by the designing engineer and interpreted by the drop forger and his artisan co-worker, the die maker.

In the specification of tolerances and subsequent inspections, much waste is caused by failure to differentiate between essential

and non-essential limits. If a typical specification, such as:

"Allowable variation of dimensions controlling finished surfaces is  $+0.010$  in. unless otherwise specified,"

were rigidly enforced without regard to utilization, variations in non-essential dimensions beyond this rigid limit could be interpreted as "controlling finished surfaces." An inspector, unacquainted with subsequent machining operations or overzealous in securing perfection might consider all surfaces as possible chucking points "controlling finished surfaces" and thereby apply the tolerances to every dimension. Many forgings are thus condemned, some to be reclaimed by further operations, but many to be totally and needlessly lost as scrap. Naturally the purchaser must pay for the lost production.

#### Factors Affecting Tolerances

To analyze factors affecting tolerances, assume that the mechanical utilization of a part has determined sizes, location of finished surfaces, the required strength and general shape, together with any limits to mass and balance that may be required of a rotating part. The design should meet certain general conditions.

Since steel forgings are made from rolled or hammered sections, it is essential that the forging be formed with as little rupture of fibers as possible. Hence abrupt changes of cross section and sharp corners are to be avoided.

Abrupt changes of section, if unbalanced by a simi-

▲ ▲ ▲  
**COOPERATION of the designing engineer with the drop forger, especially in furnishing full information relating to machining and subsequent finishing operations and the use to which the forging is to be put, will aid materially in achieving permanently lower drop-forging costs.**

**From such contact there will ultimately emerge forging specifications and limits that can be codified and established as commercial tolerances, to the advantage of all interests, the forger, the purchaser and the ultimate consumer of the purchaser's product.**

**A timely analysis of factors affecting tolerances—and costs—is herewith presented by Mr. Clarke, who is vice-president of the Chambersburg Engineering Co., Chambersburg, Pa.**

▼ ▼ ▼

lar change in the opposite direction, tend to throw the dies out of parallel as the hammer strikes. Unless the die makes allowance for this—a matter of forging judgment and trial—a "pull" in dimensions results with a corresponding increase in attention to hammer adjustments.

A parting line, that is, a line extending around the periphery of the forging where the dies can be parted, is necessary. No dimension above or below the parting line and parallel to the parting line can be as great as the corresponding dimension on the parting line. If the parting line is in one plane, die costs are kept at the lowest point.

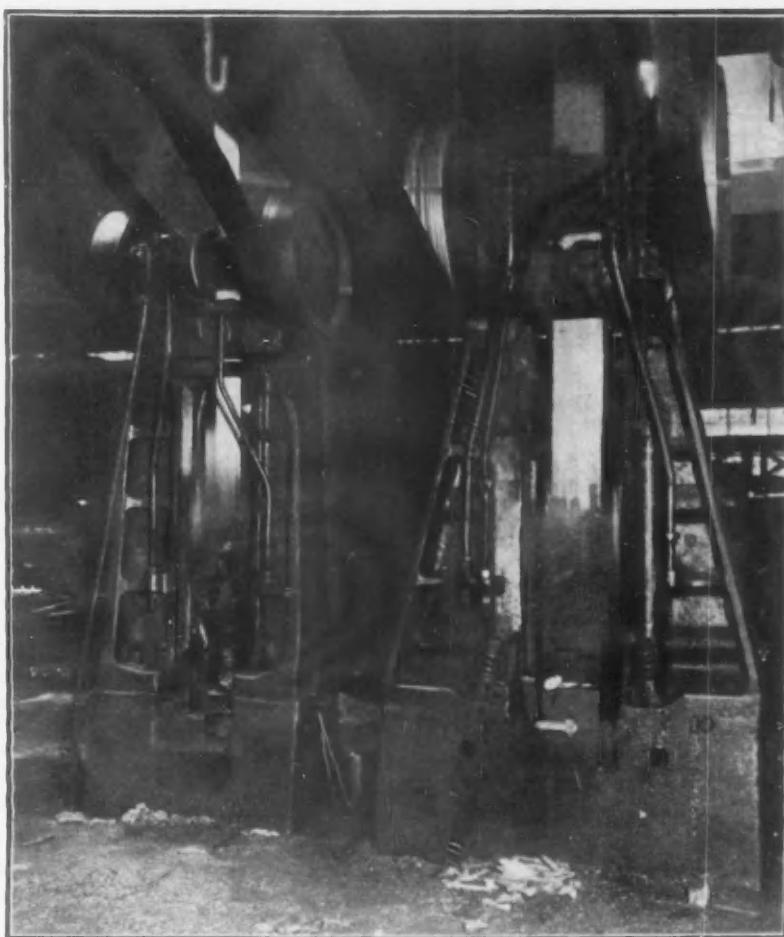
The reduction of dimension above and below the parting line is known as "draft" and 7-deg. taper has been found economical for the removal of forgings from dies. Draft requirements of less than 7 deg. usually involve greater die wear.

#### Increased Die Life Balances Extra Cost of Subsequent Operations

As dies wear the dimensions and weight of consecutive forgings are minutely increased at the points of wear. All dies wear, but it has been observed frequently that the amount of wear reduces with the use of the die. In other words, if dimensional tolerances were doubled it is probable that die life would be tripled. In such instances the saving in die charges per forging should be balanced against any extra cost of subsequent operations, caused by increased limits, to determine the economic tolerance.

In forging disks, such as pipe flanges, gear blanks, etc., where uniform strength is required around the periphery of the forging, the stock is introduced to the dies in an upright position. When the forging is roughed, ready to go into the finish impression of the die, the hammerman has no tong to position the stock as the hammer strikes. Hence any bosses, ribs or raised surfaces of other than circular shape should be deep enough in themselves to guide the stock, and should, when possible, be spaced uniformly around the disk. Lineal tolerances on such a form control the accuracy of cutting the prepared stock to length and the number of hammer blows required for the thickness limits. Ordinarily a variation of  $1/32$  in. in thickness is met at an economic rate. Finer limits will lower production and increase die costs.

Stock for forgings other than disks, except in some multi-impression dies, is introduced to the dies with the grain of the stock parallel to the longest dimension of the forging. A fixed relation exists between the allowable limits along the two right angle center-lines of the forging. The shorter dimension is made parallel to the line joining the guides of the hammer and the longer dimension extends front to



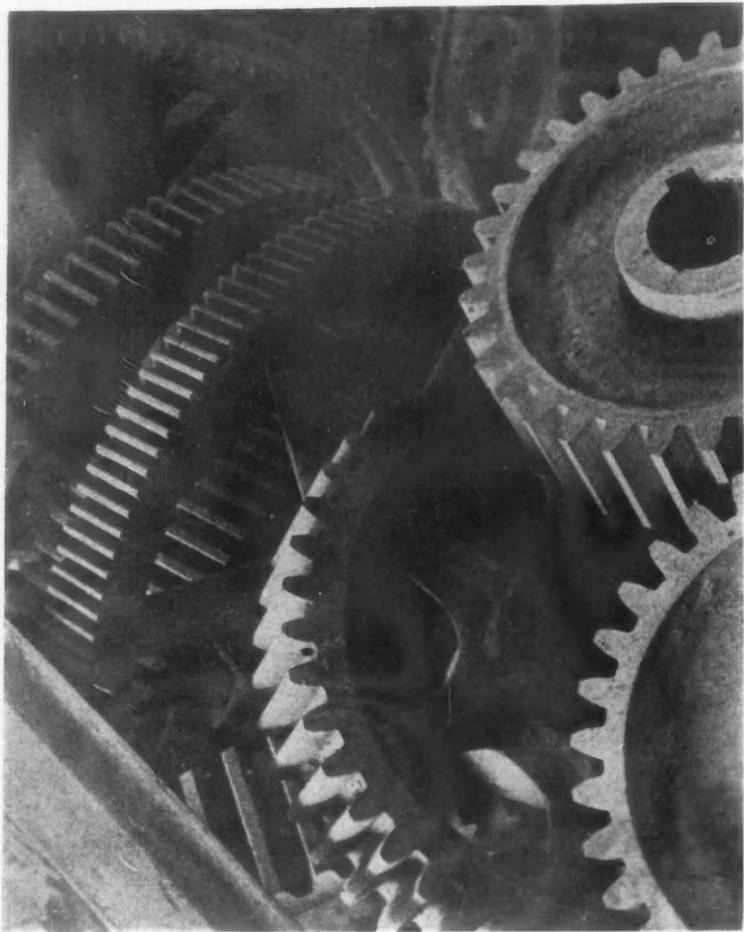
Closer forging tolerances are being met by installation of modern, heavier equipment. The old and the new machines pictured above are as photographed in a shop having a replacement program under way.

back. Operating clearances required in the hammer will permit a variation which is proportionate to the two right angle dimensions of the forging. Hence if the forging be twice as long as it is wide, the tolerances for the longer forging center-line should be twice the tolerances for the shorter forging center-line.

#### Closer Forging Tolerances Secured by Heavier Equipment

Closer tolerances, or the decreasing ranges of acceptable variation in dimensions, have been met in modern drop forge shops by the installation of new and heavier equipment. A few years ago drop hammers were constructed to dissipate the forces of impact by allowable movement of the structural elements guiding the falling hammer head. Tie bolts with springs permitted considerable motion, so much that slotted holes were used for the bolts fastening these guiding elements or frames to the head section of the hammer. Present-day hammers are built to confine all possible forces of impact within the hammer, resulting in a practically rigid construction. This rigid construction makes forgings more accurately, due to better guiding, and compensates the drop forger by making forgings in fewer blows, thus increasing production. Differences in the two types of hammers are readily noted in the accompanying illustration, the photograph having been taken in one of several

(Concluded on page 175)



# Machine Tool D

By FORREST E. CARDULLO

Chief engineer,  
G. A. GRAY CO., Cincinnati

**W**E appear to be on the threshold of a new period of development in machine tool design.

Cemented tungsten-carbide tools are at present in the same stage of development that the tungsten lamp was some 23 years ago. At that time the tungsten lamp was making its way because of its great increase in efficiency, as compared with the carbon-filament lamp. It was doing so in spite of the fact that its filament was extremely brittle, so that it was very difficult to handle and to ship, and its life was usually terminated by any unusual jar. The tungsten filaments were made by a process which involved sintering small particles of metallic tungsten together in such a way as to form a conducting filament. As the art of working metallic tungsten developed, it was finally found possible to weld the particles into a solid rod which was condensed by a process of swaging, and then by annealing and wire drawing, was reduced to a strong and tough filament having even better mechanical properties than the carbon filament.

Cemented tungsten carbide is now made in substantially the same manner as were the fragile filaments used in the first tungsten lamps. It is only natural to expect that in the future tungsten carbide will be so alloyed and treated that it will achieve substantially the same gain in strength and toughness as did the tungsten filament, without impairment to its hardness and durability as a cutting tool. Moreover, cemented tungsten carbide is not the only possibility on the horizon which gives promise of a super-hard material capable of being used as a cutting tool. While

we must admit that there are difficulties at the present time in the use of tungsten-carbide and similar tools, we must expect that these difficulties will gradually disappear.

Even though these difficulties do not disappear entirely, yes, even though the improvement in this material is very moderate, because of their great possibilities tungsten-carbide tools will continue to gain favor, to be used more and more widely, and to replace in considerable measure high-speed steel tools.

It may be interesting in this connection to consider a certain aspect of the development of the tungsten lamp which might escape attention. The introduction of the tungsten lamp was at first opposed by central stations for the reason that the lamps, being more efficient than carbon lamps, used less current. The efforts of lamp manufacturers in the beginning were centered on producing lamps of slightly greater candle power and considerably lower current consumption, than the carbon lamps then in use. The actual result of the introduction of the tungsten lamp was not only to make light cheaper, but because of its cheapness to gradually increase the demand for it, so that within a short time the lighting load of central stations began to increase much more rapidly than it had been increasing when carbon lamps were in use.

The first fears of central station managers, that the introduction of more efficient lamps would reduce current consumption, turned out to be entirely unfounded. Such lamps soon increased the rate of growth

# Design May Be Widely Affected By New Cutting Materials

of central station output, and were a powerful factor in making possible lower rates for power, in widely extending the use of all kinds of electrical appliances, in substituting central-station power for privately generated power, and in bringing about the present remarkable and spectacular advance in the economic and social importance of such public utilities.

The use of tungsten carbide or some equivalent cutting material may make possible similar spectacular development in the case of the metal-working industry.

## Machined Products Will Be Used in Increasing Quantities

If it is possible to machine metals three times as fast as before, machined products will inevitably be used in greatly increased quantities. New articles will find their way into the market. Those at present in use will be lowered in cost and in price, and find a much wider distribution. Articles which are worn and somewhat unsatisfactory will be scrapped at an earlier period in their life, and the general tendency will be for all kinds of metal products to move from the class of capital goods into the class of consumer goods. We may expect that in some measure the experience of the central stations will in the future find a parallel in the experience of the metal-working industries.

This will not be the development of one, two, or even five years. It is now more than 25 years since the tungsten-filament lamp became an article of commerce, and the full results of its introduction and improvement are still far from being realized, except in the field of lighting. The effects of the introduction of this lamp in allied fields, such as the use of household electrical appliances, the increased availability of power, because it can be distributed economically from central stations when it cannot be generated privately, and the development of super-power systems and rural power distribution, are still under way.

There is one difference between the development of the electrical industry due to the tungsten lamp, and the potential development of the metal-working industry due to the introduction of tungsten-carbide tools. The lamp is a simple thing and it is equally efficient whether it is used in a miner's cabin or in a scientific laboratory. All of its efficiency is inclosed in the glass and brass which inclose it. Not so the tungsten-carbide tool. It has only potential efficiency. Its actual efficiency depends upon the skill and intelligence with which it is used, and the knowledge and business judgment with which the products it makes

are developed and marketed. The efficiency of the tungsten lamp is foolproof. The efficiency of the tungsten-carbide tool, while potentially equally great, is limited by ignorance, indolence, lack of imagination and business judgment, and by a thousand other human frailties on the part of those who put it to work. Therefore, we cannot expect that the results of this new development will be, proportionately, as spectacular as were the results of the development of the tungsten lamp.

## Price of Cemented Tungsten Carbide an Obstacle

Let us now consider some of the difficulties which do now, and will in the future, hamper in greater or less degree the introduction of cemented tungsten carbide, and a development of the metal-working industry comparable to the recent development in the power industry.

The first of these is the high price of cemented

**T**UNGSTEN carbide or some equivalent cutting tool material may bring about spectacular developments comparable in many ways with those following the introduction of the tungsten-filament lamp. It is in the same stage of development that the tungsten lamp was some 23 years ago, and no doubt many of the difficulties now experienced will gradually disappear.

Unlike the tungsten lamp, which is simple and foolproof, the tungsten-carbide tool has potential efficiency only. Its actual efficiency depends upon the skill and intelligence behind its use, and upon the knowledge and business judgment with which the products it makes are developed and marketed.

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**THE problem confronting the metal-working industry is much larger than merely replacing a high-speed steel tool with one made of the superhard material. It involves not only the scrapping of cutting tools, but of jigs, fixtures, machine tools, production lines, and in some cases, entire factories. Even then there remains the development of new markets and the finding of new outlets for our shops.**

**The last revolutionary development to affect the metal-working industry was high-speed steel, upon which the entire automotive industry and all the social and economic consequences that followed in its rise are based.**

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tungsten carbide. Under present conditions this price may be justified for two reasons. The first is that while manufacturers of the tools may make a good profit at present prices, the users of the tools will make an immensely greater profit as a result of the manufacturers' scientific knowledge, experience, skill, courage and enterprise. The second possible justification for the present price is the fact that it has been very costly to develop and popularize this material, and because we are all still sadly lacking in knowledge of it and experience in handling it, the manufacturers of tungsten carbide are under the necessity of replacing a great many defective or unsuitable tools.

The fact remains, however, that in many parts of Europe, cemented tungsten carbide sells for one-quarter or less of the price that is asked for the material here. A 75 per cent reduction in the price would go a long way toward persuading many shop men to seriously consider its use, and to make them much more tolerant of failures and defects in the tools made from it. The writer finds that there is a good deal of resentment in the minds of many potential users of this material because English, German and Italian shops can get the material for a small fraction of the price which an American shop must pay, and believes that this price differential is seriously hampering the rapid introduction of cemented tungsten-carbide tools.

#### Technique of Use Differs from That for High-Speed Steel

A second matter which hampers the rapid introduction of these super-hard tools is that a somewhat different technique is necessary when they are used in place of high-speed steel tools. For instance, if a super-hard tool is used on a planer or shaper, a tool lifter is essential. If the tool is allowed to drag

back over the work or the chips, its edge will be cracked off. Again, the mechanic must train himself never to stop the tool in the cut. A good mechanic seldom does this, but still he does it often enough to ruin many expensive super-hard tools in the course of a month.

A third matter which tends to hamper the rapid introduction of these tools is that in order to get the desired high cutting speeds it is frequently necessary to change the method of machining. For instance, a piece which is out of balance, but which can be bored satisfactorily in a chuck on a lathe, or on the revolving table of a vertical-spindle boring mill, at the speeds which ordinary tools permit, cannot be machined in the same manner at the high speeds permitted by tungsten-carbide tools. It becomes necessary to do this in a different type of machine if advantage is to be taken of the possibilities of the new tools.

In the fourth place it may be found that the savings due to the use of this material under present conditions may be small. There may be a limited number of pieces required, which are machined in an automatic machine designed exclusively for their production. Or a machine may be in a production line where it is not pushed to its capacity and requires little attention, and where a reduction in machining time will mean nothing in economy.

These examples will serve to show the nature of some factors which, at the present time, are preventing a more rapid introduction of super-hard cutting tools. These tools cannot make a place for themselves. The place must be found for them, and the rate at which they make their way will depend upon the degree of intelligence and willingness with which the obstacles to their introduction are overcome by their manufacturers and their potential users.

#### Problem Wider Than Merely Substituting One Cutting Material for Another

So far we have considered only the factors which retard the substitution of one form of cutting material for another. The problem of the metal-working industry is much bigger than that. It cannot be solved by taking a high-speed steel tool out of a machine and putting in place of it a super-hard tool that will stand up to the job. The problem of the power industry was not solved by unscrewing a carbon lamp and screwing in a tungsten lamp. The problem was solved by courage and vision which are staggering to contemplate, even in retrospect. It was solved by scrapping millions of dollars' worth of equipment, which was still in perfect condition and only a few years old. It was solved by creating an entirely new rate structure. It was solved by creating innumerable new outlets for the product—power. It was solved by a vast increase in the number of customers. It was solved by casting aside all previous conceptions based on what had been done, and proceeding on entirely new assumptions of what could be done. The solution involved widespread social and economic changes, the development of new standards of taste and comfort in the use of artificial light, and even considerable political action. And the end is not yet.

If the metal-working industry is to achieve the same measure of progress in the near future as the

power industry has done in the immediate past, our problems must be tackled in exactly the same spirit and by somewhat the same methods.

We must be prepared to scrap not only cutting tools, but jigs and fixtures, machine tools, production lines, yes, entire factories. We must be prepared to throw overboard methods of manufacture, designs of machine tools, and designs of product. A lathe or planer designed in the eighties is just as out of date today as an 1880 steam engine and dynamo, and the time is not far distant when a 1920 model machine tool will be as out of place in a machine shop as a 1910 engine and generator is today in a modern power plant.

#### Bulk of Machine Tools Similar to Those of 20 Years Ago; Most Power Apparatus Designed Since War

The difference between the two industries is, in a measure, shown by the fact that there are now in active use in American shops thousands of machine tools of the designs current in the '80's, while there are almost no engines and dynamos of that date in use in American power plants. The great bulk of the machine tools now in use are exactly similar to the tools designed 20 years ago, but over 90 per cent of the power generated today is generated by apparatus designed since the war.

The automotive industry is probably the only industry where any considerable proportion of the metal-working machinery is modern in design and construction. It may be remarked in passing that among the worst offenders in the use of obsolete machinery are machine-tool builders themselves, whose plants are filled with tools whose designs have long since been discontinued.

In reviewing the experience of the power industry, the fact is borne in on us that even when we have replaced obsolete tools, developed new methods of machining, redesigned our products to take full advantage of the possibilities of the super-hard cutting materials, there still remains the development of new markets for metal products and the finding of new outlets for the products of our shops.

This is a matter which will take more imagination than the writer possesses, even to outline it. It will probably involve vast improvements in communication and transportation, in building construction, and in the manufacture of every sort of product for which mankind can find a use. Along with it will go social and economic advances comparable with those which parallel the development of the power industry. To realize the possibilities of any major improvement in the production of goods or services requires a breadth of view which only a few men possess. Some who have such a breadth of view will become Prophets of Industry; and will lead the way to a new social and economic order, while others of great technical ability, but lacking the divine spark, will follow, without realizing whither they are being led.

The last revolutionary development to affect the metal-working industry was the discovery of high-speed steel. The entire automotive industry, and all the social and economic consequences which have followed its rise, are based upon high-speed steel. With-



**R**EDUCTION of time required for cutting has received most attention from both machine tool designers and production engineers. To this end millions have been spent in developing tool materials and more powerful machining equipment. But tungsten-carbide will reduce this element of total machining time to a relatively subordinate position. In the not-distant future the time required to fasten the work in place, to bring the work and tool into proper relative position, or the time required to secure the tool in place—depending upon the type of machine tool and the nature of the work—will receive first consideration.



out this steel, the automobile would today be only the costly toy of the rich, and because the number of automobiles which would be required would not justify the engineering developments, good roads, service stations, and other facilities which now serve the automobile owner; the few expensive automobiles that would be built would be relatively useless.

As a further commentary on the backward status of a large portion of the metal-working industry, in spite of the tremendous development which has been brought about by high-speed steel, and its effect in expanding certain branches of this industry, a very large proportion of metal-working tools now in use were designed and many of them built before the advent of high-speed steel, and while high-speed steel does improve their efficiency, the limit of this improvement is set, not by the properties of steel, but by the abilities of the tools.

#### Effect of These Developments on Machine Tool Design and Use

**W**ITH this brief outline of the present status and future possibilities of our industry, let us consider the probable influence of recent developments on the design of machine tools and the technique of their use.

A machine tool is, in its essential features, a combination of the following five elements:

- A—Means for holding a piece to be worked on,
- B—Means for holding a cutting tool,
- C—Means for guiding and moving the work or workholder in a fixed path, at a desired rate of speed,
- D—Means for guiding and moving the cutting tool in a fixed path at a desired rate of speed,
- E—Means for quickly bringing the work, or the tool, or both, to any desired relative position.

When we analyze the total machining time required to do a job in a machine tool, usually termed the

floor-to-floor time, we find it can be resolved into the following six terms.

- 1—Time required to fasten the work in the proper position in element A.
- 2—Time required to fasten the tool in proper position in element B.
- 3—Time required to bring the work and tool into proper relative position by element E.
- 4—Time required for cutting.
- 5—Time required for inspection and measuring.
- 6—Time required for removing work and chips.

Of the above six terms, the one which has always received the greatest amount of attention from both machine-tool designers and production engineers is term 4. In order to reduce the time required for cutting, millions of dollars have been expended in developing and testing new types of tool steel and super-hard alloys. Hundreds of millions of dollars have been spent in purchasing other tools which have greater power and rigidity, can take deeper cuts and coarser feeds, can move work or tools faster and will put more tools to work simultaneously. Hitherto the thoughts of tool designers and tool users have centered very largely around the problems of how to cut metal faster, how to take as many cuts as possible at the same time, and how to get the exact speed which would give the maximum rate of metal removal.

Next to the cutting time, the third term, namely, the time required to bring the work and tool into the proper relative position, has received the most study. Efforts along this line have been due almost entirely to machine tool designers. They may be grouped into four classes as follows:

- A—Rapid traverse mechanisms.
- B—Adjustable stops, micrometer dials, vernier scales and work indexing mechanisms.
- C—Turret mechanisms.
- D—Special cutting processes, such as hobbing.

Because the above devices are the development of machine-tool designers, rather than of machine-tool users, they are not always demanded when tools are purchased. In certain lines of work, such as turret lathe and special-purpose milling, these devices have gained a firm place in shop practice, and are now demanded by machine tool users, especially for quantity production. There are, however, large fields into which they make their way only by special effort on the part of machine-tool builders, consider-

able persuasion being required before the purchasers of tools will recognize their utility and value.

#### Reduction of Cutting Time Will Not Be Dominant Consideration

At present, as in the past, the purchasers of machine tools seem to center their attention almost entirely on the possibilities of reducing the cutting time. Since this is the term of the total time which can be readily determined by arithmetical computation, production engineers are prone to devote to it an unnecessary amount of attention. Since it is the one element that is in any degree within the control of the machine-tool builder, it is the one element on which he is most apt to lay stress in attempting to sell his products. When tungsten-carbide tools are brought to the attention of either the machine-tool builder or user, the first thought is to concentrate every effort on seeing how much further cutting time can be reduced, and to examine critically, and in great detail, the possibilities in this regard.

The writer is convinced that this attitude of mind will soon change. In the past the cutting time has been the dominant one of the six terms which constitute the total machining time, but the introduction of tungsten carbide is bound to reduce it to a relatively subordinate position. In the not-distant future, the term that will receive first consideration will be the time required to fasten the work in place, the time required to bring the work and tool into proper relative position, or the time required to fasten the tool securely in place. Of these, the one which will give the greatest possibility of cost reduction will depend on the particular type of machine tool which will be used, and the nature of the work to be done.

In the case of the turret lathe working on bar stock, use of a collet has long been recognized as a method which very quickly fastens the work in its proper position. The problem in this case is extremely easy and no great difficulty is experienced in the design of a suitable mechanism for the purpose. This is a case where there is a long established and satisfactory practice which reduces this time to a minimum. The collet is a widely accepted device which replaces the old fashioned method of cutting off a piece of the proper length, centering it and driving it by means of a dog.

One of the most spectacular things which has occurred in the machine tool field in recent years is the rise of the centerless grinder. The great gain which has

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**MANAGEMENT has frequently been remiss in not providing suitable machinery, jigs, fixtures and shop furniture for the workmen, and in not directing and assisting in the development of new technique and methods of work. Many shops are equipped with machine tools of old designs, with second-hand tools or cheap models that are anything but efficient.**

**Half-way measures in solving the problems hitherto neglected will place users of machine tools in the position of being marginal producers, likely to be forced out of business at any time by the pressure of men who are willing to give their problem the constant study which modern conditions demand.**

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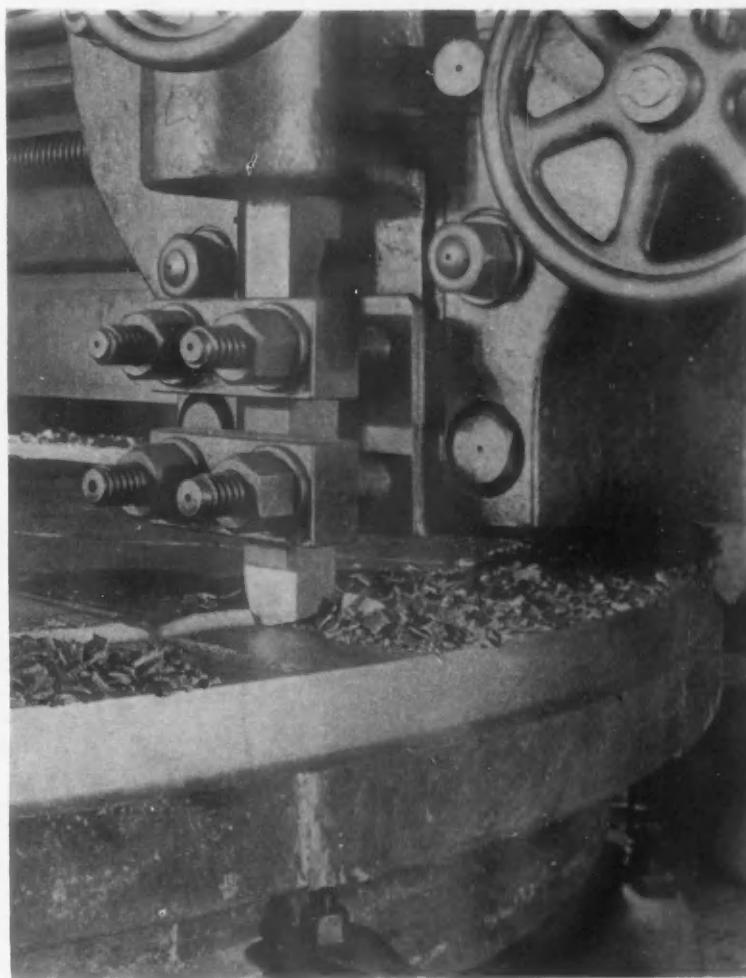
been accomplished by the use of this machine is due solely to a new method of holding the work while it is presented to the cutting tool, in this case the grinding wheel. Savings made by this means have been startling. May it not be that other savings equally startling are possible in other fields of work when a similarly radical change is made in the method of holding the work and presenting it to the cutting tool?

The present tendency in machine-tool design, except in the case of special machinery built for making a specific piece, is to leave to the machine-tool user the entire task of designing the devices for holding the work. The question of how to hold the work has already received much attention in the case of small and medium sized pieces produced in large quantities, and to a very considerable extent it has affected the design of special production machines. This, however, covers only a portion of the field of metal working, and the general solution of the problem of holding medium and large-sized pieces of irregular form still remains to be solved.

When a sufficiently large number of pieces of identical or nearly identical design are to be made, the user generally develops simple fixtures or jigs for holding the work. When this is not the case, the production department, if there is one, or the shop executives, if there is no production department, usually pass on to the individual workman the task of "designing" the method of holding the work. As a result, jobbing work and most work done in small lots, is usually insecurely held by a heterogeneous assemblage of worn and damaged bolts, clamps, wedges, angle plates, stops, and set-screws, and the work requires a great deal of time to set it up. We may expect that one of the first effects of a radical reducing of cutting time will be the introduction of ingenious devices for holding any sort of irregularly-shaped piece in a drill press, planer, shaper, or other similar tool. As these devices become standardized and developed, it is probable that improved forms of them will eventually become incorporated in the tools on which they are to be used, exactly as a collet or a chuck has become a part of the equipment of a lathe. Methods and devices for holding work will certainly receive much serious study from many machine tool designers and users in the future. In many cases such fixtures will be designed to present the work to the tools in a variety of positions, so that by simple manipulation of the fixtures, holes may be drilled or faces machined at any required angle one to another.

#### Adequate Attention Not Paid to Setting to Exact Angle for Accurate Work

To some extent, fixtures have already been developed or tool carriers designed for performing such work. Instances are circular tables for slotters, universal tables for shapers, swiveling devices for the



heads of planers and boring mills, and many similar devices, which present the work to the line of feed or line of motion of the cutting tool at a variety of angles, without the necessity of reclamping the work in the holding fixture. Often these devices are graduated so that they may be quickly set to approximately the desired angle. Setting to the exact angle required for accurate work has not received adequate attention, and frequently the methods of adjusting the devices are clumsy. We may expect that this matter also will soon receive attention, and devices which work smoothly and can be set accurately without loss of time will appear on the market, so that the performance of jig borers in quickly and accurately locating work under a boring tool will be substantially duplicated in machines and fixtures which quickly and accurately present the work to other forms of cutting tools in proper location and angular relation.

We have already made a beginning on this kind of work in many types of machines. We know how the problem can be handled, but the users of machine tools do not seem to be very keen about purchasing such equipment as an extra when it is not already an accepted part of the equipment of such tools.

The problem of fastening the tool into some form of tool-holder is in some respects made easier by super-hard tools, if it is economical to use these tools at cutting speeds which permit of unusually long life. If the nature of the work and number of pieces is

(Concluded on page 219)



NOON time in the tool room.  
This picture was taken from a  
crane and is unposed.

# Iron Ores Beneficiated by Direct Reduction and Concentration

By DR. GEORGE B. WATERHOUSE

Prof. of Metallurgy, Massachusetts Institute of Technology  
and Consulting Engineer and Metallurgist

THE recent meeting and round table discussion of the iron ore session of the American Institute of Mining Engineers at Chicago showed the great interest that is felt in iron ore reserves and beneficiation of the leaner ores. For a great many years William H. Smith, president, General Reduction Corporation, Detroit, has been paying attention to this general question and, while developing his process for the production of sponge iron, has also considered its application to the beneficiating of iron ores. This short article will present some of the results obtained by him in working along these lines on ores from many localities.

The reduction ovens and the Smith process were described in *THE IRON AGE*, April 25, 1929. In comparison with the blast furnace, low temperatures are used. The ore and carbon pass downward in retorts through zones which permit of subjection to rising

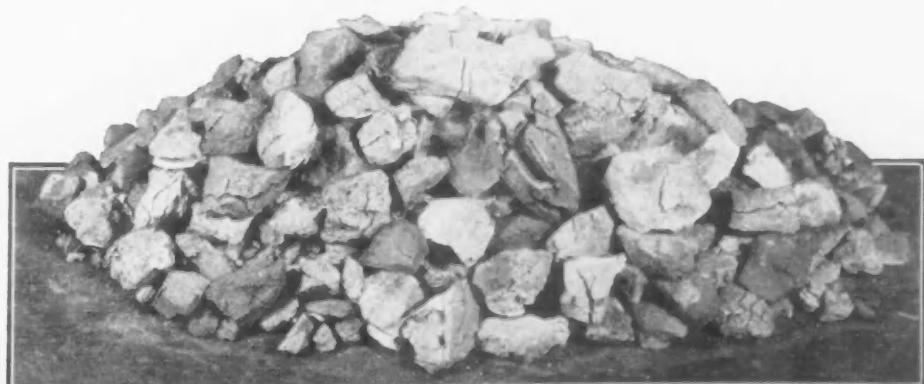
**T**HIS article is an argument for the beneficiation of low-content iron ores by the sponge iron process as developed by W. H. Smith, thus to render them equal to high-grade ores and to augment iron ore reserves. After the gangue is magnetically separated, the concentrates are briquetted. If rich enough in iron, they may form part or all of the charge in steel melting furnaces. Otherwise they may constitute part of the blast furnace charge. It is claimed that the blast furnace will be greatly aided, briquetted material taking the place of fines and low-grade ores.

temperatures sufficient to maintain reducing gases rich in CO in contact with the charge, so that the ore is progressively and continually reduced without congealing the reduced iron. This reduced material is cooled in the lower parts of the retorts before discharge, the air for cooling serving to support combustion for heating the retorts.

The ovens or retorts are built in batteries to reduce heat losses and facilitate handling of materials. There is no sintering or slagging action, the gangue of the ore re-

maining unchanged. The ore may be charged either coarse or fine, one of the illustrations showing a Lake ore, 1½ in. and under, which has been reduced and which now has its iron in the metallic condition as sponge iron.

The process of beneficiation, as visualized, consists in low temperature reduction of the ore, followed by crushing and magnetic concentration. This concen-



Reduced Lake ore, 1½ in. and under.



Reduced sponge iron  
after briquetting.

tration will remove from 20 to 90 per cent of the gangue, depending on the ore and the degree of crushing. The concentrates are briquetted. If rich enough in iron, they may form part or all of the charge of steel melting furnaces. Otherwise they may form part of the blast furnace charge, being much richer in iron than the original ore and considerably lower in gangue.

The table shows the results obtained on various ores from our own and other countries and the possibilities of this method. The ore shown in the picture already referred to had 60.6 per cent Fe after reduction. After crushing to  $\frac{1}{4}$  in. and concentrating, 95 per cent of the product had 84 per cent Fe, the remaining 5 per cent had 10 per cent Fe. If crushed after reduction to 100 mesh and concentrated, 93 per cent of the product had 95 per cent Fe. Such material

can be briquetted as also here shown, and is suitable for steel making, while material containing more gangue may also be briquetted. It will be seen from the table that many of the low-grade ores are made equal to those of the highest grade, so that iron ore reserves are considerably increased.

By this method of direct reduction and concentration of ores it is felt the blast furnace itself can be greatly helped. It can be relieved of handling fines and low-grade ores and their place taken by briquetted material of materially higher iron content and lower gangue percentage. The charge will be kept more open which will permit of faster driving and greater production, the gangue to be slagged off will be less, which will allow of smaller flux additions, which in turn will lead to lower coke consumption. There is at least a probability that the top gases will be richer in

### Iron Content Increase by Reduction and Gangue Separation for Iron Ores of Various Countries

Country	Iron in ore, per cent	Reduced iron per cent	Country	Iron in ore, per cent	Reduced iron per cent	Country	Iron in ore, per cent	Reduced iron per cent
<b>AMERICA:</b>								
Alabama	40.50	57.00	AFRICA:	52.75	80.00	ITALY:	46.00	70.50
Colorado	56.50	90.20		42.50	77.46		55.69	83.50
Michigan	38.00	78.27	BRAZIL:	38.80	64.30	LUXEMBOURG:	27.00	59.40
Michigan	59.65	87.40		66.62	94.10		35.50	57.20
Michigan	50.80	83.90		29.70	58.71		38.50	64.80
Michigan	62.90	94.96		68.49	97.70	MEXICO:	61.00	90.00
Minnesota	51.80	84.80		60.45	93.30		69.20	93.50
Minnesota	59.00	82.00		65.26	91.00	NEWFOUNDLAND:	53.86	74.38
Minnesota	57.18	84.00		54.00	90.00	NEW ZEALAND:	14.45	71.50
Minnesota	58.42	83.00	CANADA:	50.33	70.00	PANAMA:	62.97	84.20
Minnesota	57.80	85.70		36.80	65.00	PORTO RICO:	62.19	89.40
Minnesota	64.05	92.00		66.00	91.94	RUSSIA:	23.08	74.12
Minnesota	59.50	97.00		44.00	91.00		25.28	65.50
Minnesota	36.95	78.00	CHILE:	65.00	93.37		28.74	84.33
Minnesota	56.76	80.40					58.66	93.67
Minnesota	55.88	81.00	CUBA:	47.08	72.80	ENGLAND:	36.70	47.50
Minnesota	35.41	63.10					52.00	79.40
Minnesota	56.86	83.80					37.80	61.30
New York	41.47	55.10	FRANCE:	43.07	66.10		43.07	66.10
New York	33.50	95.00						
New York	46.00	96.00	HUNGARY:	30.43	61.40	SPAIN:	43.00	79.00
Tennessee	39.80	73.30		62.58	88.50		55.50	84.10
Utah	56.10	86.28	INDIA:	62.00	91.00	SWEDEN:	65.42	93.60
Virginia	37.17	54.60					69.22	95.00
Washington	65.40	92.10						



Another form of briquetted reduced sponge iron.

carbon monoxide than at present with consequent increase in fuel value.

No mention was made of flue dust in the table. This already contains considerable carbon so that less has to be added if it is to be treated by the reduction process. It can be treated very successfully, one sample containing originally 54.9 per cent iron being raised after treatment to 86.7 per cent iron. This material is usually fine enough so that no crushing is needed before concentration.

For many purposes the melting and slagging mentioned above may also be carried out in the cupola, or in other types of furnaces.

#### Secretary of Commerce Report for 1930

**I**N a pamphlet of 36 pages the Secretary of Commerce makes his annual report for the fiscal year ended June 30 last. It is divided into three main sections—Economic Review, covering 14 pages; Elimination of Waste, 19 pages; and Progress in Development of Safe Aeronautics, three pages. The secretary finds, as of last June, that manufacturing output was greater than the average of the calendar years 1923-1925, minerals output was about the same, railroad freight was off 8 per cent, electric power production showed an advance of 55 per cent, building contracts in 37 States were down 27 per cent, department store sales were off 5 per cent and sales of mail order houses were up 66 per cent.

In most cases production of the principal lines of manufactured and semi-manufactured products and minerals was less in the fiscal year ended last June than in the preceding year, but more than two-thirds of the items showed greater production than in the year 1927-1928.

Surveying construction contracts, public works, public

utilities, industrial and commercial and the miscellaneous groups of buildings and structures showed a value about equivalent to that of 1929 fiscal year, and somewhat ahead of the year ended June 30, 1928. In residential buildings, however, the last fiscal year was only about one-half as heavy as that ended in the middle of 1928, and very considerably down from that of 1929, which itself was below 1928.

Foreign trade in the last fiscal year showed a drop. Exports were off 12.6 per cent and imports, 10.3 per cent, from the preceding fiscal year. Both were below the two years ended respectively in 1928 and 1927, also. Something of a change has been noted in the direction our exports have been taking. Thus, while 55 per cent of all our exports in the fiscal year 1922 went to Europe, only 46 per cent in the recent fiscal year had that destination. For the last four or five years Europe has taken less than one-half our exports.

Another noteworthy item in comparing 1930 with 1922 fiscal years shows that our exports of foodstuffs in the latter year are down 44 per cent, whereas exports of raw materials are up 11 per cent; of semi-manufactured goods, up 54 per cent; of finished manufactures, up 90 per cent. Imports are up under all four categories, by percentages ranging from 31 in the case of foodstuffs to 93 in semi-manufactured goods. Raw materials and finished manufactures are up 41 and 44 per cent respectively.

The article by G. S. von Heydekampf, entitled "Cold Rolling Raises Fatigue or Endurance Limit," which appeared in *THE IRON AGE* of Sept. 18, went to press just after the author severed his connection with the Babcock & Wilcox Co., and the statement therein printed that he was identified with that company was therefore in error.

Reduced iron ore with gangue after briquetting.





**N**ORTH side of press bay of City Auto Stamping Co., showing large double-crank presses at left and small double-crank and single-crank presses at right, the latter in the foreground. Hoods protect the floor openings through which scrap is delivered to a conveyor below. Two of these hoods appear at right.

Steel storage and blanking bay is at bottom of next page. Unloading track is at the left and in the adjoining space is the stamping department. Unit heaters are shown along the outer wall under the crane runway.

In the exterior view of the plant the steel storage and blanking bay is at the right. Stamping department is in the center and assembly department at the left.



## *Straight-Line Travel 250 Ft. from Raw Material to Shipping Dock*

**D**ESIGNED for the economical production of large stampings of light-gage steel, the equipment and its arrangement and the efficiency methods followed in the new plant of the City Auto Stamping Co., Toledo, Ohio, make it an outstanding addition to the list of modern stamping plants serving the automotive industry. Important features of this plant include a short, straight-line flow of work across the plant from the receiving track to the shipping track, and the handling facil-

ties, which include traveling cranes in bays in which heavy material is handled, and one conveyor line for the assembly of fenders and another for the removal of scrap by which means the floor is kept practically free of scrap material.

Total width of the plant is 240 ft. and the straight-line travel of work from a receiving track inside the plant to a shipping track alongside the opposite side of the connecting buildings is only slightly more than the plant width.





Assembly bay, showing at the right the fender conveyor. Fenders move along this for successive operations. In the foreground are assembled front-section units. Bus bars with outlets for electric current run lengthwise, just under the transverse beams. One appears at left, along the columns.

There are three main connected buildings. The first is a steel storage and receiving bay, the second the press shop, each of these being 72 ft. wide and 312 ft. long, and the third an assembly building 96 ft. wide and 504 ft. long. Alongside the assembly building is a covered storage and loading dock. Die shop and offices are at the front end of this building. The storage and press shop buildings are of good height and all buildings are well lighted.

Steel is received in the storage bay, bundled, in open cars, and is handled with a 15-ton traveling crane. The unloading track, which is depressed, extends through the greater part of this bay along the outer side. There is also a depressed unloading dock for trucks. Dies and press parts are all handled with the storage bay crane. Blanking and other first operations are done in this bay on blanking presses, squaring shears and roller levelers, located along the side adjoining the press bay.

In the first line of press equipment are nine toggle presses, located at the side of the press shop nearest the storage bay. These, used for deep-draw-

ing operations, are in various sizes, the largest weighing 360,000 lb. Next comes a row of 11 large double-crank, single-acting presses and, in a third row, are smaller double-crank single-acting presses and a few single-crank presses. The machines in these two lines are used for forming, trimming and piercing.

#### Flexibility Provided for in Use of Machines

Ten movable presses are provided for intermediate operations, these being moved around and set at the side of fixed-position machines.\* A hook attached to the back of each movable press assists in handling it with an overhead crane.

One interesting practice in press operation here is the use of several medium-sized dies in one large double-crank press, for as many as five successive operations. The piece passes from one die to the next. After each downward stroke of the ram one finished piece is removed, others are moved forward for successive operations and a new blank is placed in the first die. Considerable handling of large stampings from one press to another is saved by this method, and this practice also adds to the flexi-

\*A similar arrangement of movable presses was described in THE IRON AGE of Nov. 13, 1930, page 1365.

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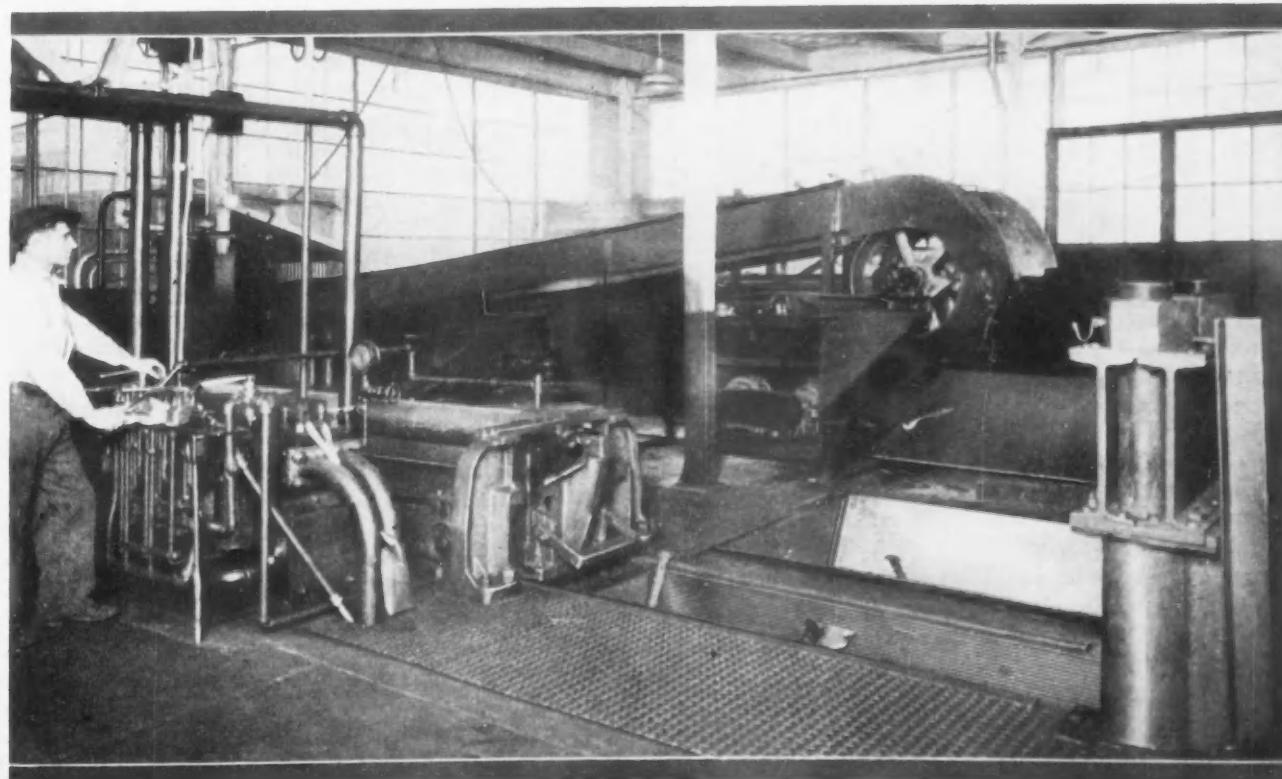
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# Dividends as Factor in Consumer Buying Power

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DIVIDENDS from corporation securities have assumed a more important place in the incomes of the American people, and therefore the reduction of corporate earning power because of driving down of selling prices, such as has occurred in steel, for example, is called by the author a shortsighted policy that will endanger the maintenance of the American standard of living.

UNTIL the last few years, wages and salaries were the principal income of the large percentage of the American people; but this, like many other things, has changed. The number of holders of stock in various corporations of this country has increased tremendously in the last few years, which causes the return on this form of investment to assume greater importance.

A list of stockholders of almost any corporation would today show a large percentage in the earner class. Any curtailment or reduction in dividends affects the purchasing power of these people; therefore, the maintenance of dividend payments and dividend rates is becoming almost as vital as the maintenance of our wage standards.

Wages and salaries paid to the 6,286,949 industrial and railroad workers during the first nine months of 1930 aggregated approximately \$12,500,000,000, according to the Monthly Labor Review of the United States Department of Labor. From the best information obtainable, the dividends paid over this same period equaled approximately 30 per cent of that huge total. Wage and dividend rates can be maintained only by the ability of industry to earn a fair return upon the capital invested.

Certain features are allowed some industries in establishing their commodity prices, which is almost equivalent to a guaranteed return upon their investment; while other industries, of a highly competitive nature, are compelled to meet prices which almost eliminate any possibility of a return upon the capital invested in the industry.

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It is only human nature to make all efforts possible to purchase at the lowest possible figure, but a low purchase price that will not allow the manufacturer

to make a reasonable return is just as uneconomic as the most wilful waste. Buyers in a great many instances point with pride to certain purchases made, which in many cases can be traced later to the ultimate elimination of a source of supply.

Examination of the return on invested capital of the various industries will show the steel industry to be one of the smallest earners. There are reasons for this, keen competition being one of the principal factors. Steel prices have receded to a point where even the small returns of past years will be impossible. And in face of these facts a demand was made quite recently, by a member of the United States Senate, for an investigation of the recent attempt to stabilize prices on steel.

Without reasonable prices, all of the hue and cry we have been listening to recently for the reestablishment of prosperity calls for the impossible.

## Dividend Reductions Endanger Our Stability

Newspaper announcements of wage reductions have been read with much concern, but the average reader is giving no thought to the announcement of the reduction of dividends or their discontinuance. Dividends not only affect the present American condition, but our future life in a large way depends upon the continuance of dividends.

Many of our educational institutions have been endowed with trust funds composed of stocks, the returns upon which have been the basis for future programs. Any impairment of this will seriously affect the educational system of our country. Many of the foundations that have contributed much to our welfare and happiness are operating the same way.

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that would accompany the reading in our morning newspaper that four or five such corporations, employing a vast number of employees, were going out of business overnight. Were any attempt made to jeopardize the interests that make possible the employment of this number of men, the resulting indignation would amount to a frenzy. But still, by shortsighted policies and our constant driving down of prices, we are doing this very thing.

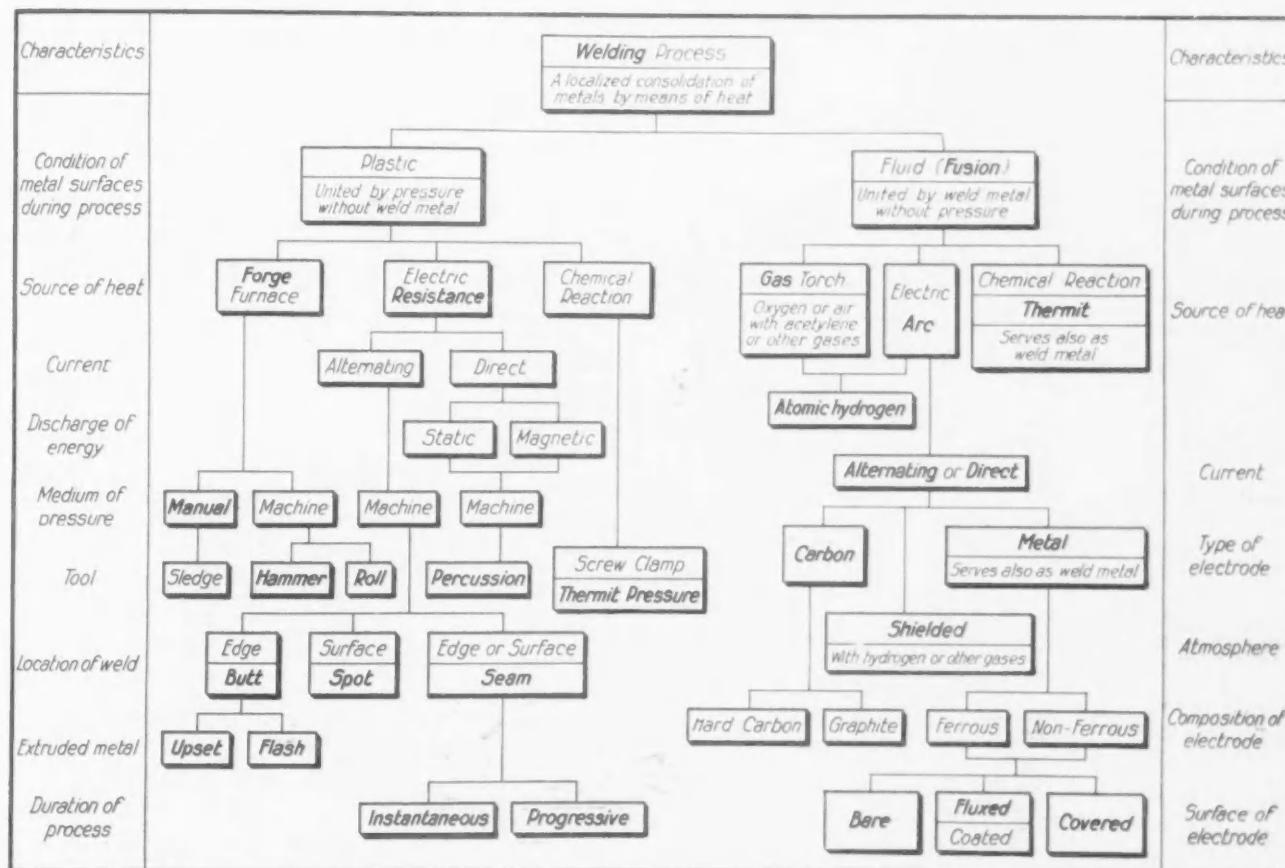
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As the American standard of living increases, the necessity for maintaining it will become more imperative. And its maintenance will be directly contingent upon the far-sighted buying policies of the American people. There is no one industry that has contributed

more to our present position than the steel industry. Without steel our progress would not have been possible; but immediately upon the attempt to establish a "live and let live" policy by this important basic industry, an investigation is immediately demanded by politicians claiming to be protecting our interests.

So, in fairness, not only to ourselves, but to all parties concerned, in purchasing let us ask ourselves this question: What is the price I should pay that will enable the manufacturers to pay wages equivalent to our present standard of living, and enable them to pay a dividend rate that will earn for their stockholders a fair return upon their investment, thereby restoring the purchasing power of not only the wage-earner, but the investor as well, and thus hasten the return of American prosperity?

### PRINCIPAL WELDING PROCESSES CLASSIFIED



**I**N view of the multiplicity of processes and types of equipment now embraced by the welding art, this chart classifying the principal processes and clearly showing functional relationships should be eminently useful.

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Assembly bay, showing at the right the fender conveyor. Fenders move along this for successive operations. In the foreground are assembled front-section units. Bus bars with outlets for electric current run lengthwise, just under the transverse beams. One appears at left, along the columns.

There are three main connected buildings. The first is a steel storage and receiving bay, the second the press shop, each of these being 72 ft. wide and 312 ft. long, and the third an assembly building 96 ft. wide and 504 ft. long. Alongside the assembly building is a covered storage and loading dock. Die shop and offices are at the front end of this building. The storage and press shop buildings are of good height and all buildings are well lighted.

Steel is received in the storage bay, bundled, in open cars, and is handled with a 15-ton traveling crane. The unloading track, which is depressed, extends through the greater part of this bay along the outer side. There is also a depressed unloading dock for trucks. Dies and press parts are all handled with the storage bay crane. Blanking and other first operations are done in this bay on blanking presses, squaring shears and roller levelers, located along the side adjoining the press bay.

In the first line of press equipment are nine toggle presses, located at the side of the press shop nearest the storage bay. These, used for deep-draw-

ing operations, are in various sizes, the largest weighing 360,000 lb. Next comes a row of 11 large double-crank, single-acting presses and, in a third row, are smaller double-crank single-acting presses and a few single-crank presses. The machines in these two lines are used for forming, trimming and piercing.

#### Flexibility Provided for in Use of Machines

Ten movable presses are provided for intermediate operations, these being moved around and set at the side of fixed-position machines.\* A hook attached to the back of each movable press assists in handling it with an overhead crane.

One interesting practice in press operation here is the use of several medium-sized dies in one large double-crank press, for as many as five successive operations. The piece passes from one die to the next. After each downward stroke of the ram one finished piece is removed, others are moved forward for successive operations and a new blank is placed in the first die. Considerable handling of large stampings from one press to another is saved by this method, and this practice also adds to the flexi-

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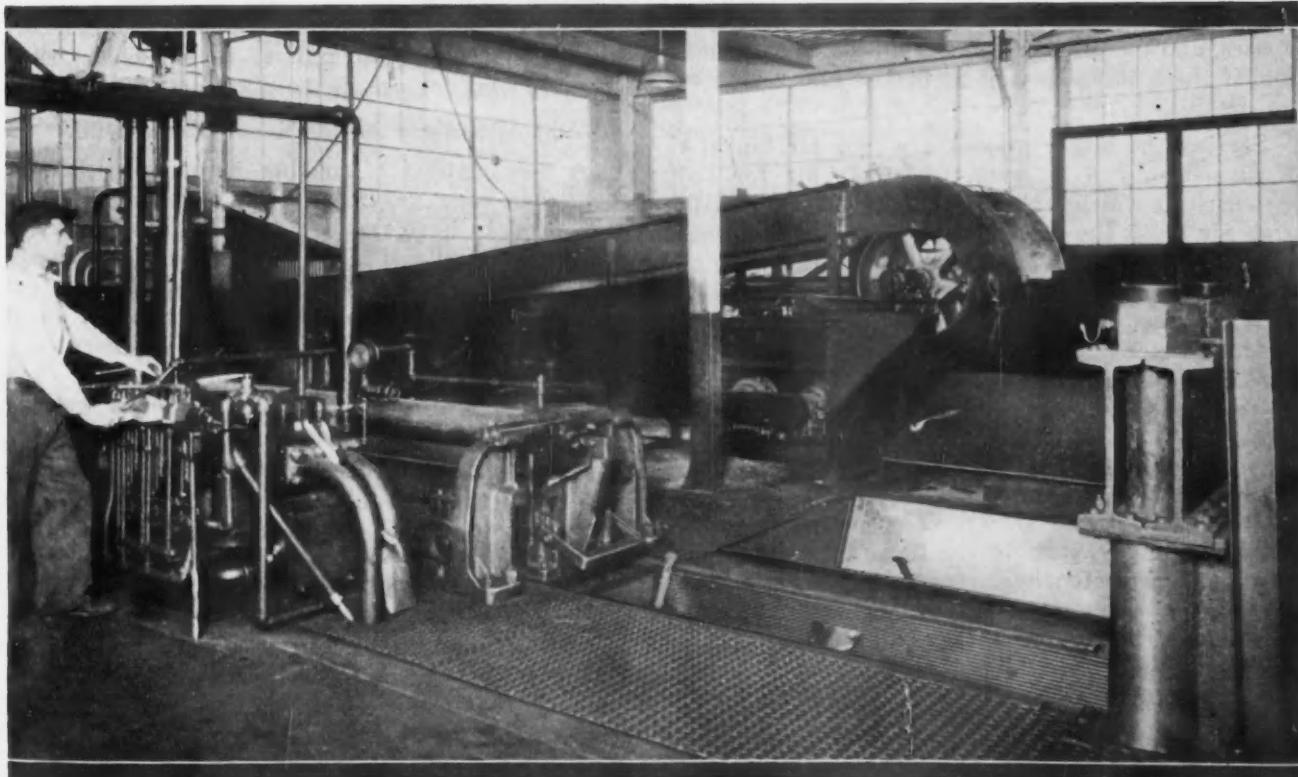
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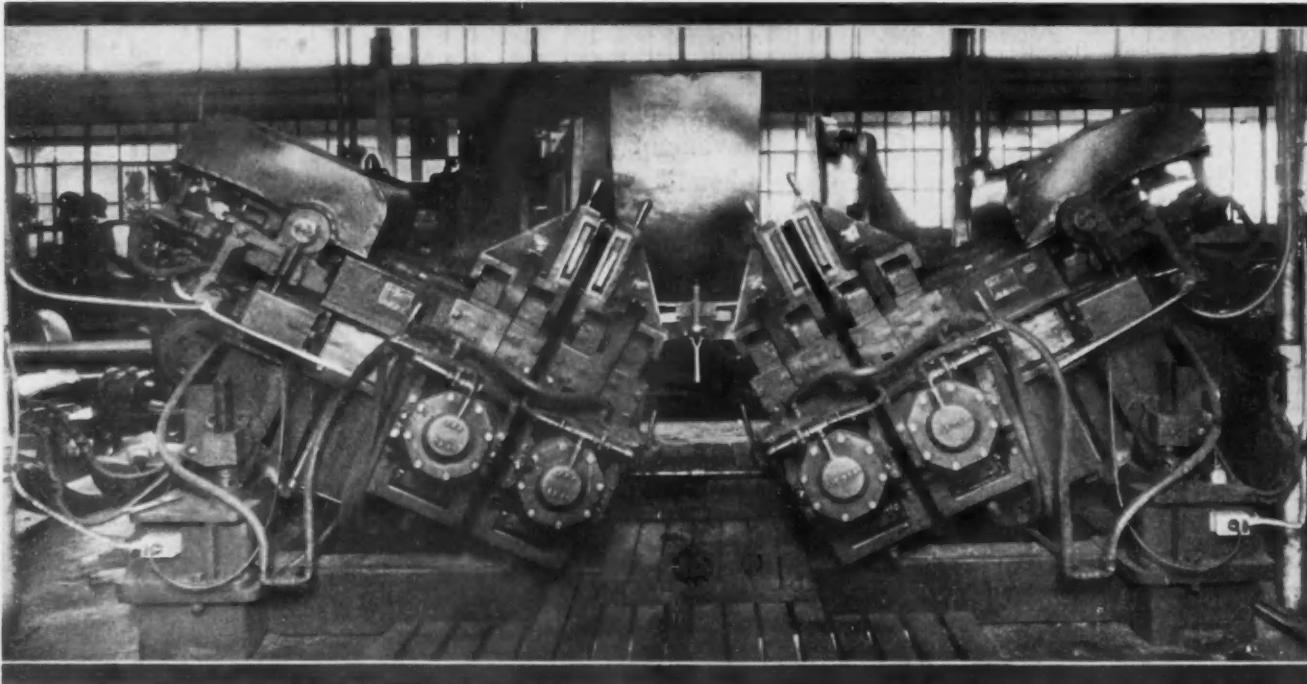
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Special flash welding machine used for welding cowl sides to the cowl top.

bay, so that the crane will clear the highest toggle press that may be installed. The top of the crane rail is 26 ft. 9 in. above the floor. The crane runway in the storage building is 20 ft. above the floor.

Located in continuous pits under the presses are the scrap conveyor, gas compressors, air tanks, electric, gas, water and air lines. The pits are all connected, allowing easy access to the equipment under the presses, and are kept dry and clear. In this respect they differ from individual pits in many stamping plants, which are often partly filled with water and oil. With connecting pits there is no necessity of digging up floors for power lines to presses, and the pit arrangement allows easy inspection of these lines as well as of the under side of the presses.

Serving the larger presses are four air tanks, 3 ft. diameter by 6 ft. high, to supply air for the pneumatic cushions and safety cylinders. With large air tanks the air pressure in the tanks is not raised above 10 to 15 lb. on the downward stroke of the ram, which is considerably less than would be the case were smaller air tanks used. Space is saved by having these tanks beneath the floor, instead of in an elevated position in the press room, where they might be in the way of other equipment.

#### Disposing of Scrap

Used largely for trimmings, the scrap conveyor extends beneath the two rows of crank presses. Openings, 30 ft. apart, in the floor above the conveyor, and protected by hoods that can be turned either way, permit the scrap to be thrown in from either side. The scrap conveyor is 32 in. wide, made of 5-ply belting.

Scrap is carried on the conveyor to a baler house of steel and glass construction, located a short distance from the press shop. Here it falls into a hop-

per, from which it is dumped into a Logerman Brothers scrap baler. The bale of scrap is discharged from the baler on to a short elevator which dumps it into a chute through which it falls into a railroad car.

In case of scrap to be kept separate because of the analysis of the steel from which it is produced, the bales are discharged through an opening in the side of the building and handled with a hoist. One man, located in the baler house, suffices to operate the entire scrap-handling and baling system.

Scrap material in flat form from the blanking presses and shears, that is in large enough pieces for making small stampings, if salvaged, being stored in bins for use in the plant or sold.

#### Making Radiator Shells Without Leaving Marks

A new method of making automobile radiator shells has been developed by the company. This is claimed to have resulted in remarkable savings, in both material and labor. Instead of forming out a shell from a large sheet, and then piercing out the center, the usual method, a curved blank about 6 in. wide is stamped out and a short piece of a similar section that forms the bottom of the shell is flash welded to the larger member on a welding machine located at the side of the storage bay.

Welded blanks in the approximate form of the finished shell are laid in a forming die, the top and bottom edges of the strip being held by the blank holder. Then the shells are formed with one drawing operation, with the pressure of the punch on the inner side of the piece. With this method of forming, drawing marks and scratches are confined to the inner sides of the shell and the outer surface that requires a smooth finish for plating usually shows no marks.

(Concluded on page 176)

# Steel Warehouses Weather Depression Successfully

**M**OVEMENT of iron and steel products out of warehouses during 1930 reflected in most instances the general trend of the steel industry. Following a year of comparative prosperity, in which jobbers and distributors were offered an opportunity to correct some of the ills of their business by mutual cooperation and group action, 1930 brought individual problems along the line of maintaining profits in the face of reduced volume of business which did not allow the progress of the industry as a whole to be given the attention it had received in the two preceding years. Nevertheless, constructive programs undertaken in the past were carried along insofar as conditions permitted, and the warehouse industry is entering the new year in essentially as strong a position as might reasonably have been hoped for.

In a year of declining steel prices it was natural to expect speculation to have been entirely lacking, and not in recent years have jobbers given as much attention to their stocks and new purchases as in the last 12 months. Thus, the tendency on the part of the warehouse industry to concentrate on its essential functions of selling and distributing steel has been further emphasized, and the old-fashioned policy of speculative buying in anticipation of periods of heavy demand seems definitely to have disappeared. The drastic decline in buying of all classes of goods which followed the stock market panic of 1929 found jobbers with more than ample stocks of goods which had gradually been built up during the period of heavy demand in the preceding year. However, these stocks heretofore had been scarcely adequate and only the sharp reduction in demand made them burdensome. Liquidation was carried on in all possible ways in the closing months of the year and the beginning of 1930 found warehouse stocks of steel fairly well adjusted to current demand. After a general replenishment of stocks in January and February, declining requirements of steel warehouse customers over the remainder of the year forced the industry to continue stock liquidation and maintain inventories at a point sufficient to take

care of urgent consumer needs and at the same time prevent the concentration of too much capital in stocks. Fortunately, mills were able to cooperate with jobbers in prompt shipments and the entire experience helped to place the warehouse business on a sound basis.

#### Consumer Demand More Urgent

As usual in a period of light demand, steel jobbers were called upon to serve a larger number of customers in 1930 than in normal years. Many consumers who ordinarily use enough steel to warrant direct buying from mills called upon the warehouses to provide them with small quantities at short notice. Others which continued to derive their principal supplies from mills were forced to seek supplementary tonnages from distributors after having allowed their inventories to decline to a point at which they could not afford to wait for the slower shipments from mills. In most cases mills recognized the value of the jobber in such emergencies and did not compete any more than they usually do in seeking small orders which should normally go to warehouses. However, jobbers continued their efforts to secure mill cooperation and succeeded in persuading producers to set up quantity differentials on the small lots which they shipped direct. While this policy was not always rigidly enforced, it developed a movement, which, if carried on, will enable consumers to buy small lots as cheaply if not more cheaply from jobbers than from mills. In the meantime, the aggregate volume of mill business would not be reduced and at the same time mills would be spared the expense of setting up expensive merchandising facilities with which distributors are already equipped.

#### Progress on Quantity Discounts

Among the policies adopted in the previous year on which progress was made in 1930 was the adoption of quantity discounts by warehouses. This plan was introduced in several distributing centers in the East during 1929 and last year was inaugurated in other

(Concluded on page 219)

**W**ITH their volume of business naturally reduced by the buying curtailment of the past year, steel jobbers have come through the period of depression quite successfully and enter the new year in a fairly strong position. Inventories have been kept reasonably low, efforts to secure greater mill cooperation have brought some good results and progress has been made in the establishing of quantity discounts.

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Dividends from corporation securities have assumed a more important place in the incomes of the American people, and therefore the reduction of corporate earning power because of driving down of selling prices, such as has occurred in steel, for example, is called by the author a shortsighted policy that will endanger the maintenance of the American standard of living.

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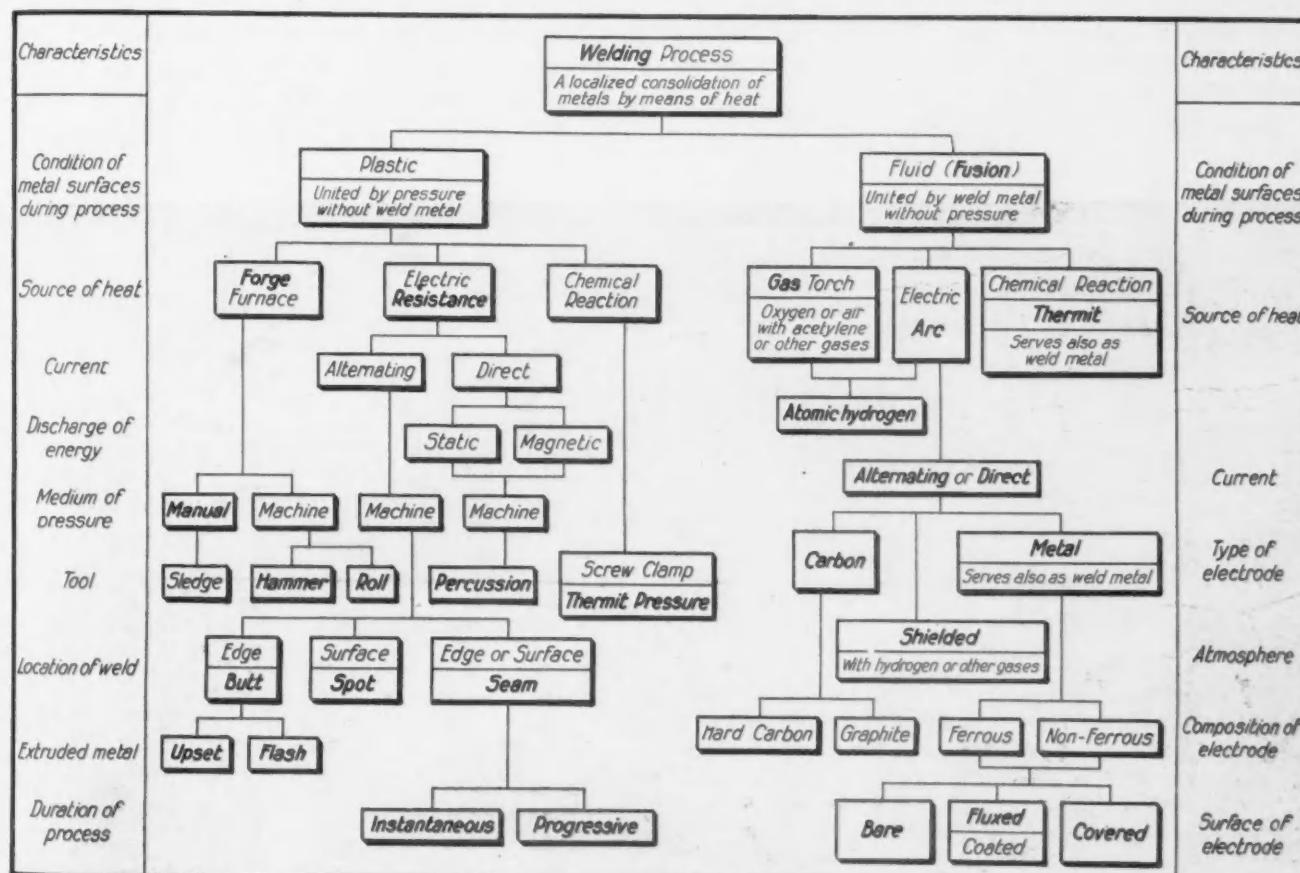
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# Electric Heat Treating of Roller Bearings Reduces Cost

By E. V. BLANCHARD

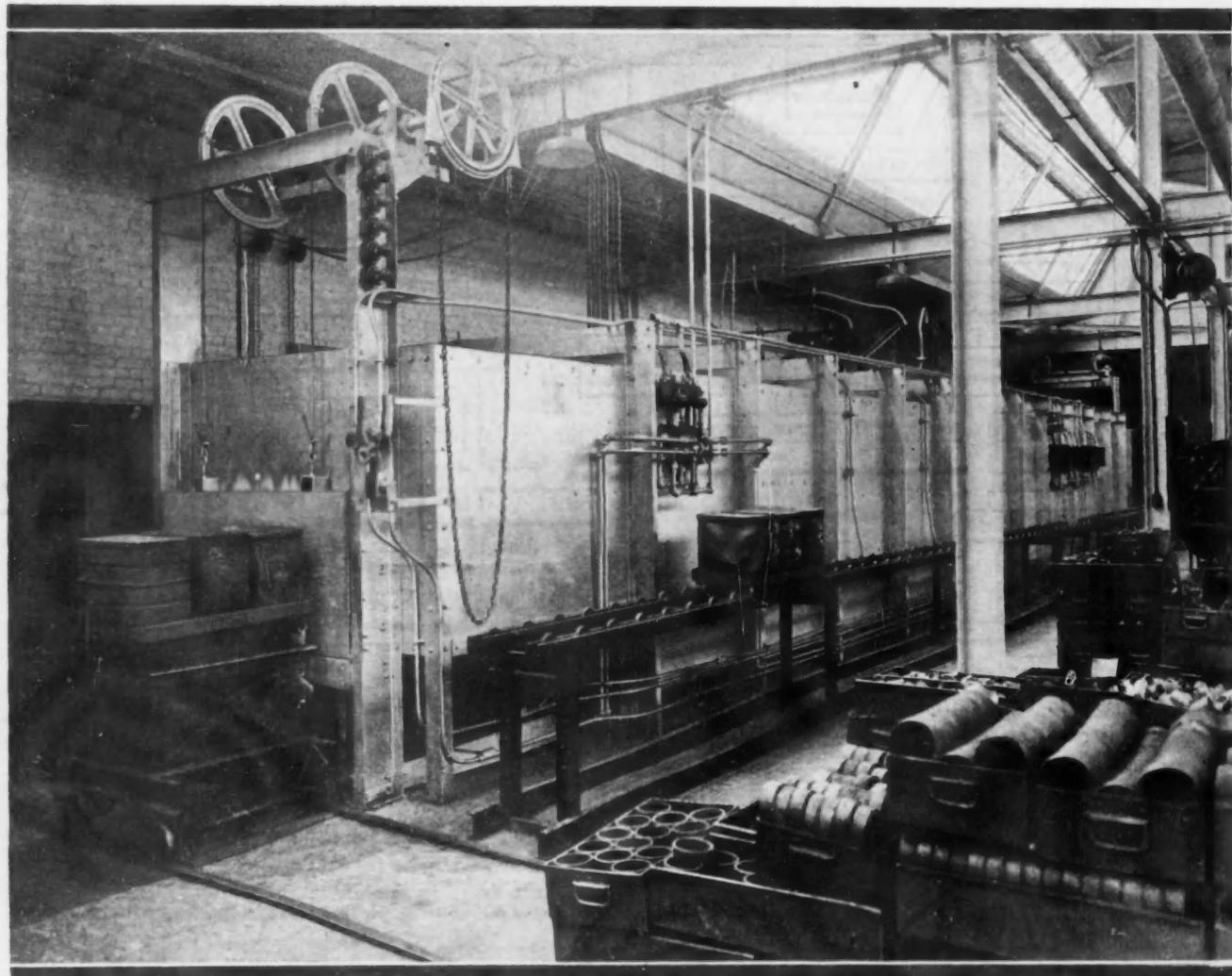
Chief Metallurgist  
Bower Roller Bearing Co., Detroit

FOR carburizing and heat treating roller bearings, cups, cones and rolls, the Bower Roller Bearing Co., Detroit, has completed an installation of electric furnaces. Although the heat-treating department now occupies twice its former space, it can handle five times the volume of work formerly done at a lessened cost. The new equipment also makes possible more uniform and better heat treatment of parts.

Cups, cones and rolls are carburized in three two-

row continuous furnaces with the temperature automatically controlled in three zones. Two of the carburizing furnaces are of the counter-flow, recuperative type. Carburizing boxes are pushed through the furnaces on alloy steel trays in two parallel rows, traveling in opposite directions, boxes being charged and discharged at both ends of the furnaces.

Three rectangular or two round boxes are loaded on each tray. The rectangular boxes are 10 in. wide, 15 in. deep and 17 in. long, while the round boxes are



15 in. deep and 17 in. in diameter, being made of alloy steel sheets welded together.

The heated chambers of the counter-flow recuperative furnaces are 42 ft. long and the recuperative chambers 12 ft. at each end, making a total length of 66 ft. One furnace is powered at 150-kw. capacity and the other 160 kw. Temperatures are maintained and controlled by three automatic control recorders on each furnace. Temperatures are held to limits of 5 deg. Fahr., plus or minus.

Other carburizing equipment includes a straight-away, two-row, 150-kw. furnace. Trays and boxes are conveyed through it in the same manner as in the recuperative furnaces. Temperature control is automatically maintained by one two-point controller recorder.

Trays and boxes are pushed through all furnaces by a hydraulically-operated mechanism with a 42-in. stroke. It is so designed that the material moves above the pusher heads. Furnaces are actuated at proper intervals by electric hydraulic control.

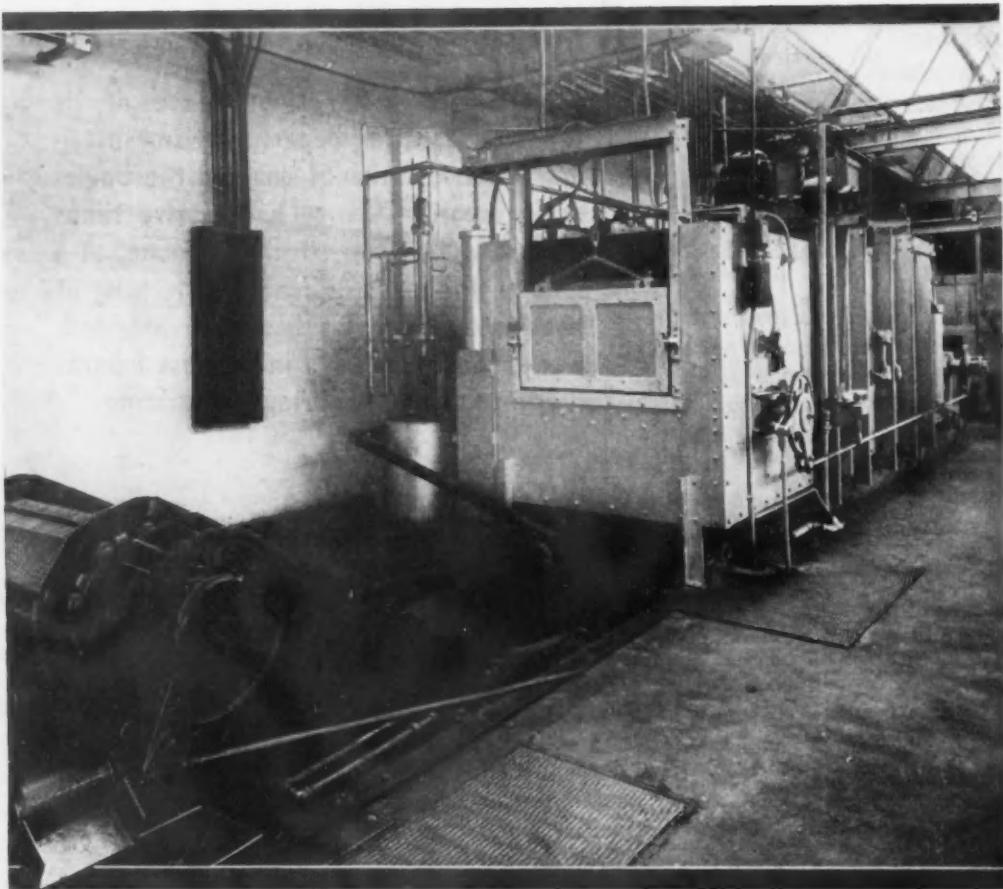
As the trays containing the boxes are removed from the furnaces, they are placed on roller rail manually-operated cooling tracks, and are delivered to the unloading station and sorting machine. The latter is made of sheet metal with a fine mesh, cone-shaped, revolving screen. The material and compound are discharged from the boxes into the large end of the

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**D**OUBLING the floor space of its heat-treating department and installing electric furnaces enabled the Bower Roller Bearing Co. to handle five times the volume of work formerly done, at a smaller unit cost. Greater uniformity of heat treatment also has been attained. Close check of parts in process insures proper control during carburizing.  
▼▼▼

cone, the compound being drawn by suction through the screen into a bin under the floor. The bin is connected to a bucket elevator which carries the compound to two storage bins under the roof. The compound then is taken, as needed, from the bins through four flexible tubes. Meanwhile, the cups, cones and rolls rotate on the cone-shaped screen until all traces of carburizing compound and dust from the steel are removed, finally being discharged at the small end of



Carburizing furnaces are of counter-flow, recuperative type. Department is painted white and furnaces are aluminum painted to give maximum light and promote sanitation. Carburizing boxes move through furnaces on alloy steel trays in two parallel rows traveling in opposite directions.



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At end of hardening furnace, material drops through hair-sealed chute into quenching tank, falling upon a motor - driven conveyor which carries it up out of the tank.

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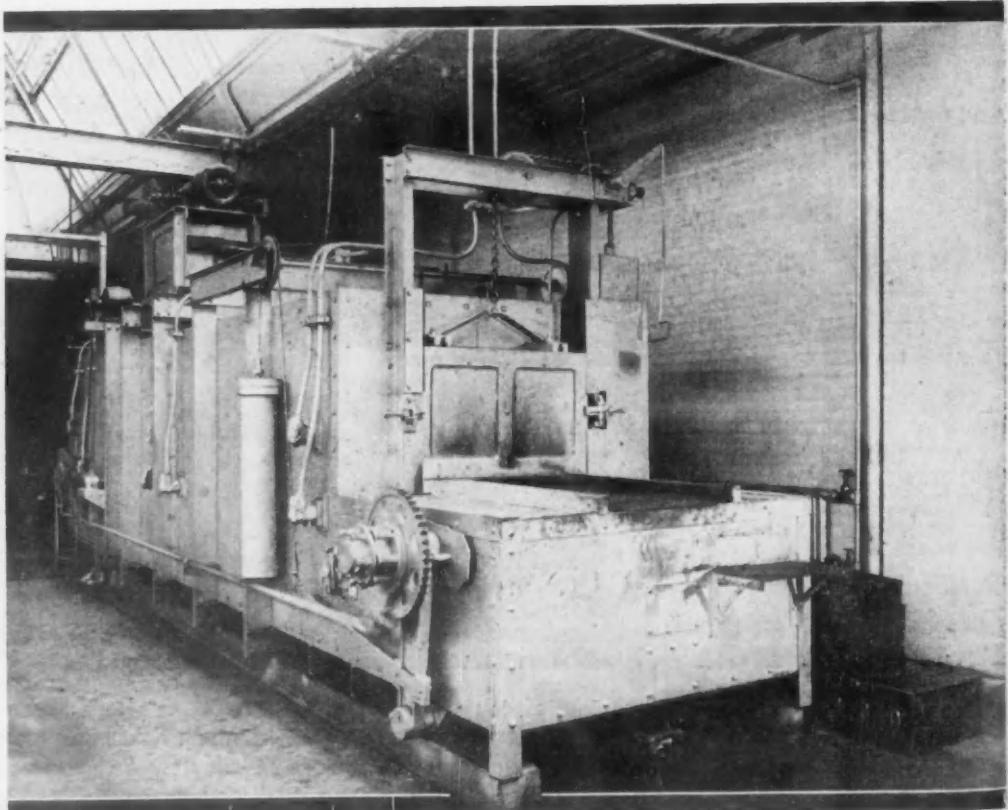
the machine into tote pans for delivery to two electric heat-treating furnaces.

Powered at 190 kw., the large hardening furnace has a capacity of 1600 lb. of material per hour. Parts

are fed by hand onto a cast iron link belt operated by two alloy steel drums, one of which is in the heating zone and the other at the charging end. These drums are rotated by an electric motor, connected to an ec-

▲▲▲  
**CHARGING**  
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▼▼▼



centric rod working vertically, which in turn is connected to a horizontal rod that meshes to two ratchets attached to the drums. Thus, when the vertical eccentric rod is moving upward, the belt is stationary; when it moves downward, it actuates the belt on which the heat-treated parts rest.

After the material reaches the end of the furnace, it drops through an air-sealed chute into a quenching tank, thereby preventing scale from forming on the quenched steel. The material is removed from the quenching tank by a motor-driven conveyor.

The smaller of the two heat-treating furnaces has a capacity for handling 600 lb. of material per hour. With the exception of the belt length and width, the cast link belt and driving mechanism are similar to the 190-kw. furnace. Temperatures of each furnace are regulated by three control recorders.

The heat-treating department is painted white and all furnaces are aluminum painted in order to give

maximum light and sanitation. The electric furnaces were built and installed by the Electric Furnace Co., Salem, Ohio; the alloys for furnace construction and the rectangular carburizing boxes were manufactured by General Alloys Corp.; alloys used for the round carburizing boxes were made by the Pressed Steel Corp.; electric timing devices are the product of Stromberg; and recorders and controllers were made by Leeds & Northrup Co.

In order to assure proper heat treatment of materials, each carburizing box is numbered, beginning with A-1 and running up to A-1000, then B-1 to B-1000, etc. A record is kept of the boxes in the department's laboratory. Each box contains a test piece which, after carburization, is broken and examined under the microscope to determine case depth. Information in regard to case depth, number of hours in the furnaces and the heat-treating cycle is entered in a master book.

## Definite Drop-Forging Tolerances Will Aid in Lowering Costs

(Concluded from page 153)

forge shops having a program of replacement underway.

Each forging must be trimmed to remove the flash, or excess metal that is forced out of the dies at the parting line. Pronounced changes in shape will cause variations in flash and in the forging that may induce warping during a hot trimming operation or tearing and splitting of the fibers during a cold trimming operation. In many such cases a slightly increased allowance for machining surfaces on the top and bottom of the parts as forged will save expensive additional operations such as hot or cold restriking.

### Advantage in Specifying Grinding Locations

When machining operations, such as drilling, must start at the trimmed parting line, specifications should call for grinding at the required points only. The lack of specific grinding locations has made the forger grind many miles of flash to no advantage.

Many parts require a bending operation after forging and trimming. This bending is usually done in dies in a bending device before the original heat of the forging is lost. Naturally a wide variation can exist in the temperature of the piece while bending. Limits established on surfaces should be considered only after a study has been made of the varying shrinkages due to varying temperatures. Often a slight increase of allowance for finish will eliminate the need of limits and the expense involved.

It is appreciated that many forgings require rigid specifications due to their reciprocation or rotating utilization. These characteristics should be made known to the forger, for they often involve special racks for carrying the parts so that deformation from piling or from the weight of a stack may be avoided.

Flat, unribbed sections have a tendency to warp while cooling. This is particularly true of thin sections which also offer the greatest resistance to flow

in forging. Thin, unribbed sections are therefore to be avoided. During heat treatment greater care in racking in the furnace is required, almost in proportion to the variation in dimensions of the sections.

### Apply Tolerances Specifically to Controlling Sizes

Tolerances in dimensions of a forging should be applied specifically to the controlling sizes. The dimensions without tolerances then become variables for manipulation of the forging stock in process, limited by accepted practice such as 1/32 in. in 1 in.

Forging methods can thereby be adopted to the maintenance of essential limits, of finished surfaces as well as of chucking surfaces, with the greatest economy of dies and elimination of scrap. Specifications for forgings can advantageously indicate how the rough forging is to be held for machining and where the machining is to start.

The modern drop forge shop is equipped with temperature-controlled furnaces, the latest rigid-type drop hammers, heat-treating equipment to meet practically all needs and a laboratory to check materials, grain flow and to study each forging to overcome defects which may develop in process. Supporting these facilities is a background of experience in the art of forging that is available to the designing engineer and for which no other source exists.

If designing engineers will fully define subsequent operations and utilization to the drop forger, they collectively will do more to achieve a permanent low forging cost range than any other contacts between their two interests. From frequent consultation there will emerge forging specifications and limits which can be codified and accepted as commercial tolerances. Such a procedure toward lower forging costs will expand the use of drop forgings and benefit the forger, the purchaser and the ultimate consumer.

## Straight-Line Travel to Dock

*(Concluded from page 168)*

This method not only saves material, but greatly reduces labor required for polishing. It is stated that the shell thus formed requires only one light polishing operation before plating. The saving in material is placed at one-third of the stock used, and the saving in finishing at two-thirds in labor; that is, the cost of finishing before plating is only one-third of what it would be were the usual methods followed in drawing the shell. This method is said to be particularly efficient for making radiator shells of stainless steel.

All stampings except fenders and other parts too large to go through a cleaner are cleaned in a tri-sodium solution in a mechanical cleaning machine located on the press room side of the finishing and assembly bay. Fenders are cleaned by wiping.

The fender assembly conveyor is of the belt type, approximately 200 ft. long, and located at about 24 in. above the floor. This is operated at a speed of approximately 10 ft. a minute. Fender assembly consists in joining the crown to the apron to make the front fender assembly, and the various operations required include spot welding, U-ing, wiring, seaming and finishing. Machines for these operations are located at both sides of the conveyor. When one machine operator finishes his work on the piece he replaces it on the conveyor and it moves along to the next operation.

Considerable space is saved, and danger of scratching is avoided, by handling the pieces on the conveyor. Separate pieces do not come in contact and the speed of assembling fenders is increased by the use of the conveyor. Leaving the conveyor, the fender passes on to an inspection table, after which it is ready for shipment.

### Power May Be Tapped at Convenient Points

Electrical current for operating the machines in the assembly department is carried in bus bars inclosed in insulated fiber cases, extending along both sides of the building its full length, under the ceiling. These have socket connections every 24 in., which makes feasible the ready moving of machines in all parts of the finishing and assembling department. Two small motor-generator sets are provided in the assembly building to convert 440-volt, 60-cycle current into 220-volt, 180-cycle current for use on grinding and drilling machines, the high-cycle current supplying increased power for the small tools.

All buildings are of steel frame and steel sash construction, with brick walls below the window line and stucco above the windows. The interior is finished with aluminum paint. The floors are of concrete and the roof is of pre-cast cement tile covered with special roofing paper. Ceilings are left clear for conveyors or other mechanical equipment. Lavatories are overhead and coat cribs are movable, to allow maximum rearrangement of equipment. Overhead steel frames in the assembly building are pierced on 8-ft. centers for attaching supports for conveyors and other equipment.

Holophane lights are used in the high bays. Light

switches are of the circuit-breaker type, no fuses being required. The buildings are warmed by unit heaters, about 30 in number, located overhead, the heated air being blown down to the floors. A gas-fired water heater is provided for supplying hot water for the wash bowls and washing machines, thus eliminating the use of boilers in the summer.

Covering 20 acres, the entire building site is laid out in 24-ft. squares, and all buildings are in multiples of this dimension. This plan of layout will be followed in extensions. An ultimate development of buildings to cover the entire site is contemplated.

This plant specializes on panels, fenders, hoods, radiator shells and other large automobile stampings. It has a capacity in its assembly department of producing 300 bodies and a like number of chassis units in a 9-hr. day. The present capacity of the press room is about three times that of the finishing and assembly department.

## Inland Waterways Development

*(Concluded from page 151)*

terminal at Cincinnati costing \$400,000, and placed into service four 2000-hp. tow boats, and 50 300-ton steel barges. The Inland Waterways Corp., the Federal barge line, placed no new barges in operation during the year, but took bids Dec. 30 on 50 large units similar to the type which it bought during 1929. The Jones & Laughlin Steel Corp. placed two new tow boats in operation and has two more under construction, which will be launched early in the new year. Various other smaller shippers added miscellaneous equipment, and prospects for further fleet additions in 1931 are good.

Work of the Illinois project, which will provide a waterway from the Great Lakes to the Gulf of Mexico, will be resumed shortly, the enactment of the emergency appropriation of \$116,000,000 by Congress having paved the way for the early allotment of \$1,200,000, and contracts will soon be awarded. The Illinois waterway was authorized more than 20 years ago, and a State bond issue of \$20,000,000 was made, but the cost will exceed this amount, and the Federal Government will now complete the work.

The Great Lakes were again utilized to a considerable extent during the past year for the movement of pig iron and finished steel. Finished steel movement from Lake Erie ports to Chicago was from 65 to 75 per cent of the total moved in that direction in 1929. A substantial volume of plates moved by boat from Chicago mills to the plant of the A. O. Smith Corp., at Milwaukee, for the manufacture of pipe.

Fully 35,000 tons of pig iron was shipped from Lake Erie ports to Chicago and Milwaukee during the Great Lakes navigation season. Two cargoes of spiegeleisen totaling 4000 tons were shipped to Chicago by an Ontario furnace, while Buffalo furnaces shipped not less than 9000 tons of silvery iron by boat into the Chicago district.

Scrap also moved from Detroit to Buffalo and Cleveland by boat in large tonnages, although the shipments were not so large as in the previous year owing to smaller requirements of the steel mills.

# Exports at Low for Year, with Imports Slightly Up

WASHINGTON, Dec. 27.—Iron and steel exports from the United States for the calendar year 1930 are estimated at approximately 2,000,000 gross tons, the lowest since 1925, when they amounted to 1,762,571 tons. Imports in 1930 are estimated at about 515,000 tons, the lowest since 1921, when they aggregated only 120,578 tons.

Estimates for exports and imports of last year are based on returns for 11 months ended Nov. 30. Exports were 1,883,037 tons, while imports totaled 477,633 tons. In both instances the relatively small trade was due to world-wide depression. Exports in the first 11 months of 1930 were 939,482 tons below those in the like period of 1929, amounting to 2,822,519 tons. Imports in the first 11 months were 226,822 tons less in 1930 than in 1929, when they aggregated 704,455 tons.

Exports in November were lower

than for any preceding month in 1930. Tin plate was the largest item, both in November and in the 11 months, amounting to 13,302 tons and 216,728 tons, respectively. Pig iron was the largest item of importation during both periods, totaling 18,292 tons and 122,241 tons. Structural shapes constituted the most important finished item of importation, amounting to 4355 and 109,591 tons, respectively.

Manganese ore imports in November totaled 10,378 tons, of which 3134 tons came from Canada, 2600 tons from India, 2350 tons from the Gold Coast of Africa, and 469 tons from Soviet Russia. Of the 2865 tons of ferromanganese imported in November, 2151 tons came from the United Kingdom and 714 tons from Canada.

## Highs and Lows of the Movements

Exports of sheets were, with one exception, the largest for any month

since last May, but tin plate made the lowest total since May, 1926. Structural steel was sent abroad in the smallest quantity since March, 1927, and rails, the smallest, except for October, 1930, since February, 1925. Scrap made the lowest total (save in September, 1930) since February, 1927, while pig iron and ferroalloys, as a group, made the smallest outbound movement in more than 30 years. Castings and forgings were the lowest since August, 1929.

On the import side, the total was the largest since last June and the pig iron and ferroalloy group the heaviest in 15 months. Scrap imports, on the other hand, were the smallest since July, 1924, and finished rolled material the lowest (except for the preceding month) since February, 1926. Steel bars were at the highest level, with one exception, since November, 1928.

## Exports of Iron and Steel Products from the United States

(In Gross Tons)

	November		11 Months Ended November	
	1930	1929	1930	1929
Pig iron	565	678	13,206	44,739
Ferromanganese	51	103	6,854	1,491
Scrap	7,917	55,554	339,519	500,571
Pig iron, ferroalloys and scrap	8,533	56,835	359,579	546,801
Ingots, blooms, billets, sheet bar	1,166	1,730	16,713	41,794
Skelp	10,825	17,499	116,636	129,339
Wire rods	2,543	2,518	36,764	39,195
Semi-finished steel	14,534	21,747	170,113	210,328
Steel bars	3,350	9,940	78,156	175,626
Alloy steel bars	244	744	6,228	14,366
Iron bars	91	397	1,695	4,853
Plates, iron and steel	6,743	16,698	93,944	182,390
Sheets, galvanized steel	6,270	7,701	{ 82,423 } 6,038	{ 139,432 }
Sheets, galvanized iron	426			
Sheets, black steel	11,651	10,352	118,783	164,237
Sheets, black iron	868	1,337	10,747	14,650
Hoops, bands, strip steel	2,125	4,634	37,491	65,657
Tin plate: terne plate	13,302	16,781	216,728	234,443
Structural shapes, plain material	8,579	25,465	132,900	273,672
Structural material, fabricated	6,414	10,972	96,996	106,251
Tanks, steel	4,167		19,586	
Steel rails	3,339	12,342	92,755	136,026
Rail fastenings, switches, frogs, etc.	1,558	2,425	18,430	29,659
Boiler tubes	900	1,474	13,925	17,588
Casing and oil-line pipe	2,533	4,265	57,940	106,601
Pipe, black and galvanized, welded steel	4,252		{ 75,203 }	
Pipe, black and galvanized, welded iron	444		{ 13,746 }	
Plain wire	1,985	2,714	24,791	42,230
Barbed wire and woven wire fencing	2,473	3,476	37,251	60,081
Wire cloth and screening	81	108	1,516	1,554
Wire rope	227	316	4,266	6,583
Wire nails	781	604	7,860	11,505
Other nails and tacks	240	945	5,386	10,290
Horseshoes	15	56	175	432
Bolts, nuts, rivets and washers, except track	533	1,058	9,441	14,756
Rolled and finished steel	83,591	144,251	1,264,400	1,942,790
Cast iron pipe and fittings	1,787	4,709	29,529	43,272
Malleable iron screwed fittings	816	840	10,028	11,339
Car wheels and axles	586	1,606	13,741	20,282
Iron castings	391	747	6,024	10,279
Steel castings	465	646	9,066	10,321
Forgings	555	684	7,881	11,360
Castings and forgings	4,600	9,232	76,269	106,853
All other	710	924	12,676	15,747
Total	111,968	232,489	1,883,037	2,822,519

## Imports of Iron and Steel Products into the United States

(In Gross Tons)

	November		11 Months Ended November	
	1930	1929	1930	1929
Pig iron			18,292	12,702
Sponge iron			2,865	4,654
Ferromanganese and spiegeleisen*			21	20
Ferrochromet			552	162
Ferrosilicon			377	3,985
Other ferroalloys			1,390	6,851
Scrap			22,945	24,779
Pig iron, ferroalloys and scrap			197,556	301,024
Steel, ingots, blooms, billets, etc.			2,162	944
Wire rods			582	1,364
Semi-finished steel			2,744	2,008
Concrete reinforcement bars			1,492	3,445
Hollow bar and drill steel			73	39,728
Merchant steel bars			3,063	35,415
Iron bars			75	57
Iron slabs			101	133
Boiler and other plate			1,711	1,652
Sheets, skelp and saw plate			24	10
Tin plate			4,355	11,961
Structural shapes			558	321
Sheet piling			1,162	3,767
Rails and rail fastenings			279	519
Welded pipe			711	591
Other pipe			7	47
Barbed wire			216	320
Round iron and steel wire			3	7
Telegraph and telephone wire			37	63
Flat wire and strip steel			195	171
Wire rope and strand			3	169
Other wire			1,587	2,513
Hoops and bands			711	591
Nails, tacks and staples			7	47
Bolts, nuts and rivets			16,460	25,713
Horse and mule shoes			841	1,140
Rolled and finished steel			105	109
Cast iron pipe and fittings			Total	43,095
Castings and forgings			Manganese ore*	54,049
			Iron ore	10,378
			Magnesite (dead burned)	73,999
				268,876
				2,598,204
				2,853,279
				4,052
				5,990
				38,148
				44,217

\*Manganese content only.

†Chromium content only.

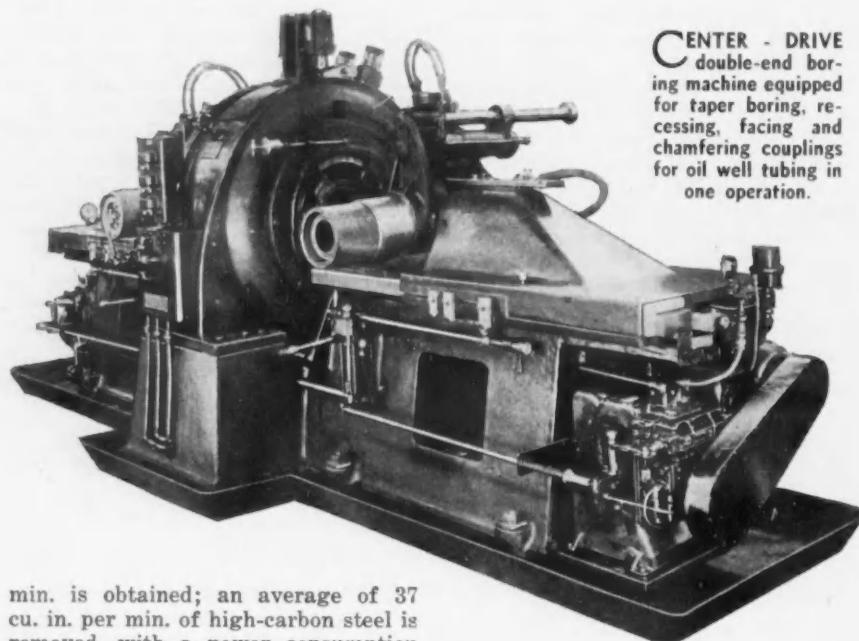
‡Silicon content only.

## New Double-End Boring Machine for Use on Couplings and Similar Pieces

RAPID operation in boring and facing pipe couplings and similar taper and straight bored work features the double-end center-drive boring machine recently developed by William K. Stamets, Jenkins Arcade Building, Pittsburgh. On 8½-in. casting coupling floor-to-floor time of 2

housing over the spindle bearings.

The spindle is driven by a 30-hp. adjustable speed motor through helical gears. The machine is electrically controlled and the controller equipment provides for automatic speed change on the motor during the chucking operation and an interlock



min. is obtained; an average of 37 cu. in. per min. of high-carbon steel is removed, with a power consumption of 0.65 hp. per cu. in. per min.

The machine consists of a chuck housing mounted in the center of the bed of the machine with two boring carriages mounted one on each side of the chuck housing. Each boring carriage is actuated by separate Oil-gear pump and cylinder, providing automatic rapid traverse and two rates of feed. Each carriage is provided with a delayed reverse which provides a dwell at the end of the stroke for facing. The carriages run on hardened and ground wearing plates fastened to the bed.

The spindle of the machine is 21 in. in diameter and is mounted on two Timken tapered roller bearings, said to be the largest ever used in a machine tool. Incorporated in the spindle is a power chuck, which is opened and closed by means of push buttons while the spindle is running. The pressure exerted by chuck jaws is adjustable, while positive means are provided for opening the chuck, regardless of the closing pressure. All moving parts in the chuck housing run in a bath of oil. By a continuous process this oil is drained from the bottom of the housing, pumped through a Purolator, and filtered oil is discharged into the top of the

between motors so that if the spindle motor stops the feed is interrupted.

A loading arm and unloading arm are provided which automatically spring into position when the carriages move back. The loading and unloading devices are actuated by compressed air. The boring heads are piloted in bushings placed close to the coupling to be bored. An auxiliary pump supplies cutting oil at the rate of a barrel a minute under 100-lb. pressure. The oil and chips discharge through openings in the bed directly into a tank below the floor level.

### Push-Button Control for Floor-Operated Cranes

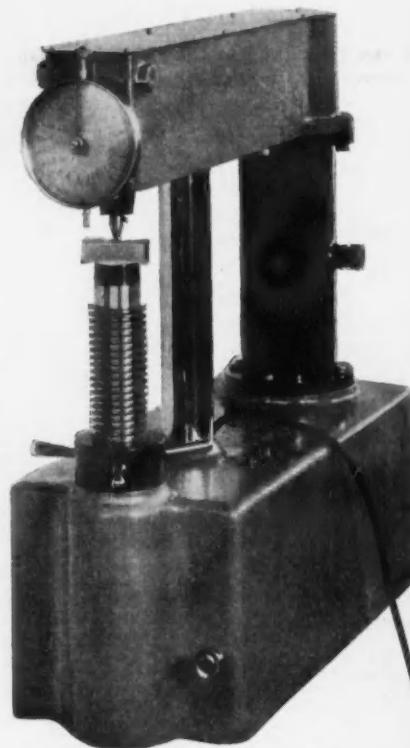
A NEW pendant-type push button for controlling small floor-operated cranes, has been developed by the General Electric Co. This is designed to supersede the present rope and chain types of control, with the advantages of greater safety to the operator, a saving in time (only one man being necessary to operate the crane) and less aisle space required on the factory floor.

The push-button station is 20½ in.

long, 2½ in. wide and 2 9/16 in. deep, less the projection of the buttons. It is of the proper size to be readily grasped and operated by one hand. The box is cast aluminum, thus being both light in weight and strong.

### Brinell Hardness Tester of New Type

A NEW type of Brinell testing machine has been put on the market by the Pittsburgh Instrument & Machine Co., Pittsburgh. It is known as the Diamo-Brinell hardness tester. It is operated by a system of weights and levers and the hardness number can be read directly from the gage attached to the machine as shown in the illustration. The indentation is produced by a diamond semi-ball of 2 mm. diameter under a load of 120 kg. The machine can be operated electrically from any light socket. After the test piece is in place and the motor started it is only necessary to pull out the starter at the front of the base and the load is automatically applied and released. It is claimed that accurate readings can be obtained from the hardest steels and



With the test piece in place and the motor started, pulling the starter button on the base causes automatic application and release of the load.

alloys and that the impressions are small with no damage to the finished work. In the case of soft material, the test load can easily be changed from 120 kg. to 30 kg. by tightening the screw on the right-hand side of the column containing the weights.

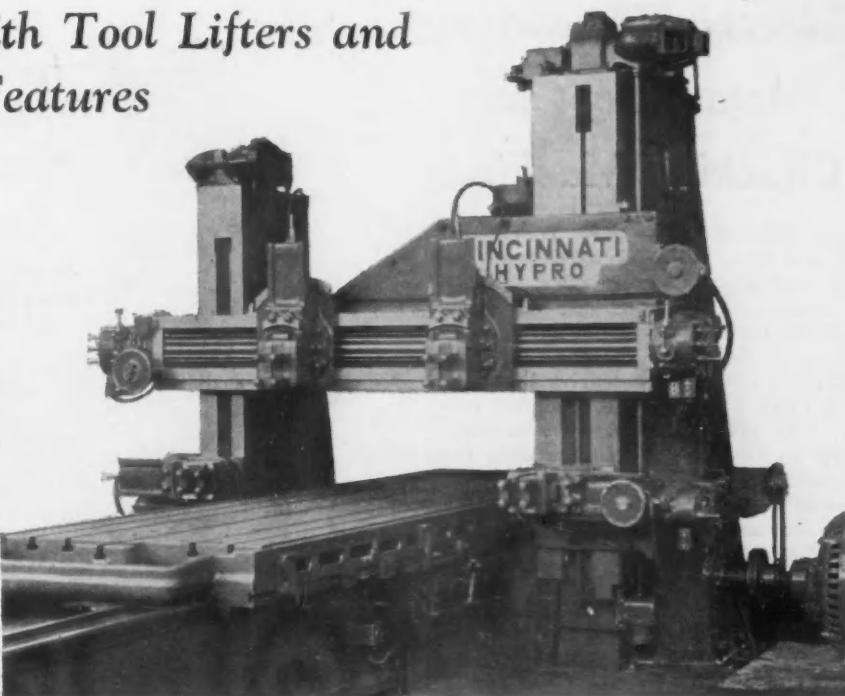
## Open-Side Planer with Tool Lifters and Other Features

PNEUMATIC tool lifters and push-button control for all movements are among the features of a new Hypro open-side planer recently introduced by the Cincinnati Planer Co., Cincinnati. An auxiliary housing arranged as shown permits use of a fourth head; it can be removed quickly to permit machining of wider pieces. This housing carries a separate small motor for rapid traversing of the fourth head.

The tool lifter attached to each head raises the tools on the return stroke, thus meeting an essential requirement when tungsten-carbide tools are employed. This device is made without projecting parts or lugs which might interfere with work in close quarters, and all moving parts are hardened and ground to give a long life. It can be used simultaneously on all heads or on any one head if desired.

This machine is now operated completely through push-button controls. The rail and knee are clamped to the column by an electric clamp operated through a torque motor. Push buttons at each end of the rail clamp and unclamp the rail, raising and lowering of the rail and rapid traversing of the rail and side heads being also controlled by push buttons.

Coolant supply and return does not interfere with the regular working surface of the table. The coolant drains to the left-hand side of the table and then through a short pipe to a steel trough extending along the



The pneumatic tool lifters are of particular advantage when tungsten-carbide tools are used. The left-hand housing, which is auxiliary equipment, can be removed in a few minutes without disturbing the connections of the planer.

bed. This trough drains, in turn, into a tank at the rear of the left-hand housing, where the small pump and motor are mounted. Piping for the coolant is fitted with universal joints to accommodate all positions of tools.

The shifting device is designed to give a short stroke varying from  $1\frac{1}{2}$  to 2 in., depending on the type of reversing motor used; this has many advantages, particularly when machining in close quarters inside of a

casting. Small dogs on the table between the regular shifter dogs permit speeding up the table over gaps between the parts to be planed.

The handwheel at left-hand end of the rail is part of the built-in indexing device for use in rack cutting and spacing. An electric speedometer on the side of the column constantly registers the table speed, both cutting and return, on a dial at the control panel.

## Two-Shaft Flexible Shaft Machine

A NEW flexible shaft machine, employing two shafts, has been introduced by the Keller Mechanical Engineering Corp., 70 Washington Street, Brooklyn, N. Y.

The first shaft, for ordinary work, uses tools with  $1/16$  to  $1/4$ -in. shanks and operates at four speeds ranging from 875 to 3500 r.p.m. The second shaft, the upper and lighter shaft, is for high-speed operation; with a speed range of 5250 to 10,500 r.p.m. it is suited for delicate work with small burrs and grinding stones. The light shaft assembly may be attached to any Keller-Flex machine with four speed pulleys, thereby doubling its usefulness. The high-speed drive can be added simply by changing the overarm for one that carries a small pulley mounted on ball bearings.

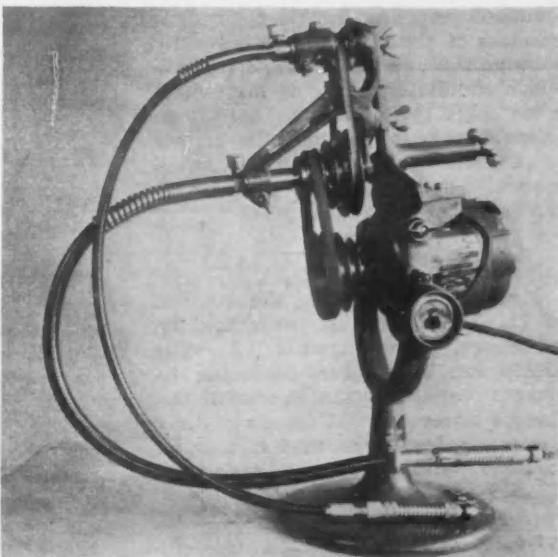
Since the work to be performed is of a delicate nature, a light and more flexible shaft is used. To release the strain on the shaft, slots are milled on the motor bracket so the whole

unit may be moved until the balance point is found. This permits easy swivelling and places no strain on the shaft as the machine is balanced in all positions.

To accommodate the shaft and small grinding stones, a new, smaller hand piece has been made (patent applied for). This is of lighter construction, but is strong and rigid with no play in the spindle, due to self-adjusting ball bearings. The outside diameter being only  $\frac{3}{4}$  in., the tool may be held in the fingers for very fine work. Felt washers protect the ball bearings, preventing entrance of grit and exit of oil.

The larger shaft may be left on the machine

for coarser work, so that the workman may quickly change from one to the other. The small shaft may also be used on jackshaft pulley, and small burrs and rasps used at the slowest speed, from 875 to 3500 r.p.m.



## Electric Threading Attachment for Chucking Machines

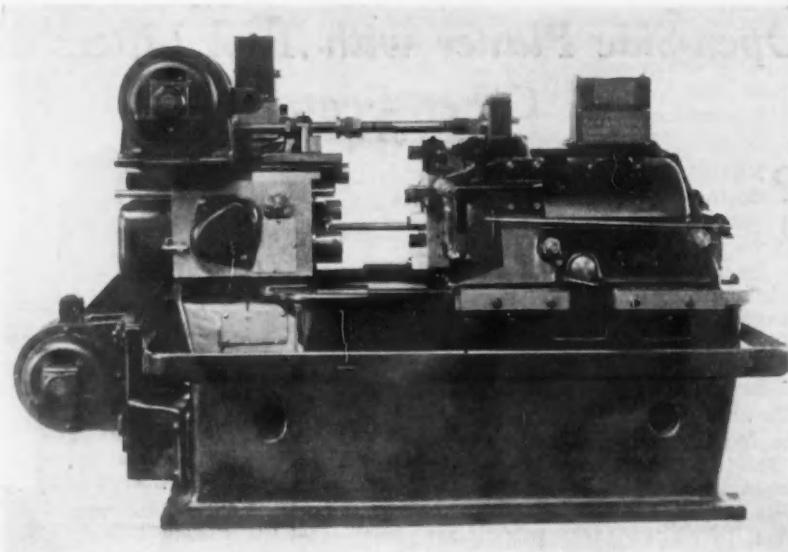
INCREASED efficiency is claimed for the independent electric reversing drive now provided for the threading spindle of the multiple-spindle chucking machines built by the Goss & DeLeeuw Machine Co., New Britain, Conn. In the drive the spindle drive is driven by a reversing motor through a worm and worm-wheel and pick-off gears, and starting, reversing and stopping the spindle is accomplished merely by throwing an electric switch. No clutches of any kind are used.

Reversing shock has been eliminated by the cushioning effect of the electric motor; and slippage, with its attendant uncertainty, caused by friction clutches, is avoided. More power can be transmitted than through a clutch. The instant and positive reverse obtained assures that the tap or die will always reverse at the same point, permitting threading close to a shoulder or to the bottom of a blind hole.

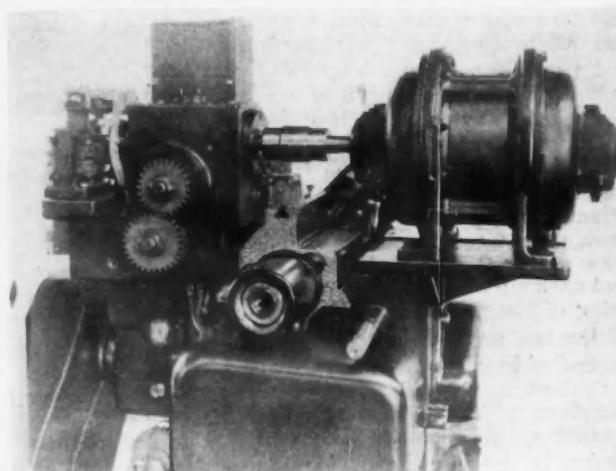
Operation of this drive is entirely automatic, the forward motion of the main slide throwing the switch into the forward position, and the mechanism itself operating the switch for reversing and stopping. All three points, starting, reversing and stopping, are adjustable. The pick-off gears provide a wide range of speeds. The spindle feed is controlled by a positive lead-screw always in engagement with its lead-nut. Two threads of different pitches can be cut simultaneously in the same spindle and both right and left-hand threads can be handled.

Either standard or high starting torque motors for either alternating or direct current can be used. The switch is of original design and only operates the control circuit in the standard reversing control box. Regardless of the line voltage only 110 volts go through the switch, a feature which eliminates arcing of the switch when high voltages are used. A solenoid brake in the motor line serves to stop the spindle and motor automatically and to prevent coasting of the motor on the return cycle.

Mechanical stokers to the number of 71, with 21,103 hp., were sold in November, 1930, against 92 with 38,276 hp. in October, according to reports received by the Bureau of the Census from the 11 leading companies. Sales in the first 11 months of 1930 totaled 1126 stokers, with 353,938 hp., against 1637 with 554,609 hp. in the corresponding period of 1929.



INDEPENDENT electric reversing drive, arranged as shown at right, is now provided for the threading spindle of the Goss & DeLeeuw multiple-spindle chucking machine. Starting, reversing and stopping of the spindle is effected by throwing an electric switch.



### Landis Introduces Ground Thread Chasers

FOR the production of threads of unusual accuracy the Landis Machine Co., Inc., Waynesboro, Pa., has developed a ground thread chaser, which is now available for all sizes of Lanco and Landex heads and for the  $\frac{5}{8}$ ,  $\frac{7}{8}$ ,  $1\frac{1}{4}$  and 2-in. Landmatic heads.

The thread form is ground by a new process on special grinding machines, the minor inaccuracies and distortions resulting from the heat treatment being thus removed and a uniform thread form with a flat crest and

root is produced. In addition to the greater accuracy, the ground thread gives a freer cutting action, increasing life of chaser between grinds.



THE thread form is ground by a process that removes the minor inaccuracies and distortions resulting from heat treatment.

# Output Not Yet Adjusted to Demand

BY LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

**A**S indicated by the accompanying chart, we find that (1) the current requirements for steel continue to decline; (2) steel production has been further curtailed; but (3) steel production is still somewhat out of line with requirements. This was the situation toward the end of 1930. As both production and requirements are adjusted for seasonal variation, the declines referred to are more than seasonal.

Our "composite demand line" is not far from the low levels reached in 1921. Even if we allow for normal growth, however, steel production is considerably higher than then, and this fact strongly suggests a maladjustment between supply and demand. But it is fair to point out the existence of some uncertainty as to this conclusion.

Our measurements of requirements are based on the activity in those industries which have been the chief consumers in the past. Any change—such as the development of new uses—may make these measurements inadequate. Possibly pipe lines partly account for the apparent maladjustment.

Decline in the composite demand line in November was due to a sharp drop in railroad freight traffic and construction activity, together with some recession in general manufacturing and mining and in agricultural purchasing power. Machine tool orders made a significant decline. About the only major factor which increased was automobile production, which fell less than seasonally, thanks chiefly to a spurt in production of Chevrolet cars. The net result was that indicated requirements were only about 76 per cent of the average for 1921-1927.

Steel production, too, is about 76 per cent of its 1921-1927 average, but it usually swings more widely in the cycle than does the composite demand line, so that, when put in terms of standard deviation, the steel production curve is relatively not so low as the curve of requirements.

According to these measurements, the situation at the end of 1930 closely resembles that in January, 1921, when the composite demand line was 72 per cent of average and the steel production curve 76 per cent. Thereafter the adjusted production index fell to 40 per cent. Unless there now exist new demand factors not adequately represented by our composite demand line, it seems probable that the production curve must fall below the composite demand line before the current readjustment is complete.

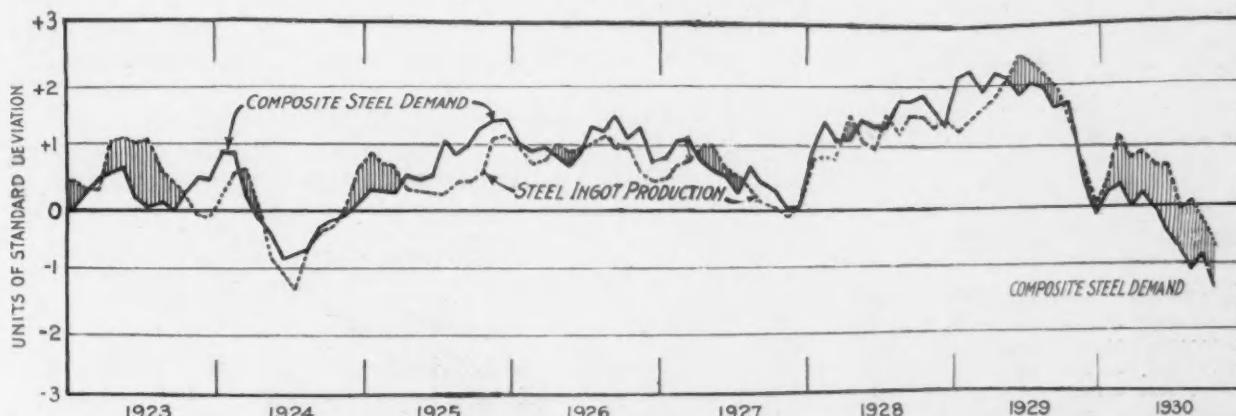
## In Particular Industries

The position of steel is simple. It depends on the outlook for the demand from the chief consuming industries, such as building, automobiles and railroads. Looked at in this broad way, the outlook is for continued depression during the next few months, with a very slow recovery thereafter.

*Building activity* reached a new low level in November and, in view of the large amount of over-building and weakness of the bond market, recovery will probably be slow. We can hardly hope for more than the beginning of a gradual and irregular pick-up by spring.

The *automobile industry* probably must continue close-reefed during the first half of 1931. Putting aside mere hopes and estimates based on past conditions, the fact is that the industry cannot expand, with the purchasing power of consumers so greatly reduced as now.

Traffic and earnings of the *railroads* in November were very disappointing, with gross revenues and net operating income, respectively, about 20 and 26 per cent below November, 1929. The markets for railroad securities are generally depressed and there is certainly little possibility that any amount of mere consolidation can increase the railroads' demand for steel.



Until production falls below demand little hope for real improvement can be held out. Present indications call for an up-movement in the spring.

# December Iron Output Off 13.7 Per Cent, Net Loss of 12 Stacks

SO many blast furnaces were banked during the holidays that output for December fell decidedly from the low rate of November. The decline in daily rate was over 13.5 per cent, bringing the operation down to the lowest since January, 1922.

With every operating furnace heard from, the daily rate for December was 53,732 tons, which was 13.7 per cent under the 62,237 tons per day for November. The net loss in active furnaces was 12 in December, as compared with four in November and 12 in October.

Coke pig iron production in December was 1,665,690 gross tons, or 53,732 tons per day for the 31 days, as compared with 1,867,107 tons, or 62,237 tons per day, for the 30 days in November. The loss in daily rate was 8505 tons, or 13.7 per cent. In November this loss was 10.9 per cent. The December loss is the largest for 1930, the next largest having been 13 per cent in July. In October the loss was 8 per cent, with 6.8 per cent in September and 4.3 per cent in August.

The December daily rate is the

smallest since January, 1922, when it was 53,062 tons per day. The most recent smaller daily rate for December was the 53,196 tons for that month in 1921.

The 1930 output of coke pig iron was 31,399,105 tons. This is a decline of 25.7 per cent from the 42,285,769 tons in 1929, the record output.

## Net Loss of 12 Furnaces

There were 14 furnaces blown out or banked during December, with only two blown in. In November eight

Daily Average Production of Coke Pig Iron in the United States by Months Since Jan. 1, 1926—Gross Tons

	1926	1927	1928	1929	1930
Jan.	106,974	100,123	92,573	111,044	91,209
Feb.	104,408	105,024	100,004	114,507	101,390
Mar.	111,032	112,366	103,215	119,822	104,715
Apr.	115,004	114,074	106,183	122,087	106,062
May	112,304	109,385	105,931	126,745	104,283
June	107,844	102,988	102,733	123,908	97,804
1/2 year	109,660	107,351	101,763	119,564	100,891
July	103,978	95,199	99,091	122,100	85,146
Aug.	103,241	95,073	101,180	121,151	81,417
Sept.	104,543	92,498	102,077	116,585	75,890
Oct.	107,553	89,810	108,832	115,745	69,831
Nov.	107,890	88,279	110,084	106,047	62,237
Dec.	99,712	86,960	108,705	91,513	53,732
Year	107,043	99,266	103,382	115,851	86,025

Pig Iron Production by Districts, Gross Tons

	Dec.	Nov.	Oct.	Sept.
	(31 days)	(30 days)	(31 days)	(30 days)
New York and Mass.	93,448	118,947	128,710	132,873
Lehigh Valley	45,411	52,344	72,938	66,448
Schuylkill Valley	27,703	25,790	25,340	25,664
Lower Susq. and Leba-				
non Valley	18,375	16,570	18,012	19,427
Pittsburgh district	346,877	425,446	530,689	554,662
Shenango Valley	47,096	50,909	54,750	64,584
Western Pennsylvania	28,656	50,856	53,952	60,241
Maryland, Va. and Ky.	60,803	69,728	83,621	91,066
Wheeling district	111,609	106,782	128,486	132,627
Mahoning Valley	67,131	118,572	157,775	186,436
Central and North'n Ohio	169,575	172,729	198,479	200,266
Southern Ohio	26,139	26,807	33,251	42,658
Illinois and Indiana	386,963	395,814	424,329	427,819
Mich., Minn., Mo., Wis.,				
Colo., Mo. and Utah	101,254	93,627	106,683	110,202
Alabama	134,650	142,186	147,753	161,797
Tennessee				
Total	1,665,690	1,867,107	2,164,768	2,276,770

Daily Rate of Pig Iron Production by Months—Gross Tons

	Steel Works	Merchant	Total
	Iron	Iron*	
December, 1929	68,152	23,361	91,513
January, 1930	71,447	19,762	91,209
February	81,580	19,810	101,390
March	83,900	20,815	104,715
April	85,489	20,573	106,062
May	84,310	19,973	104,283
June	77,883	19,921	97,804
July	66,949	18,197	85,146
August	64,857	16,560	81,417
September	62,342	13,548	75,890
October	57,788	12,043	69,831
November	49,730	12,507	62,237
December	40,952	11,780	53,732

\*Includes pig iron made for the market by steel companies.

Coke Furnaces in Blast

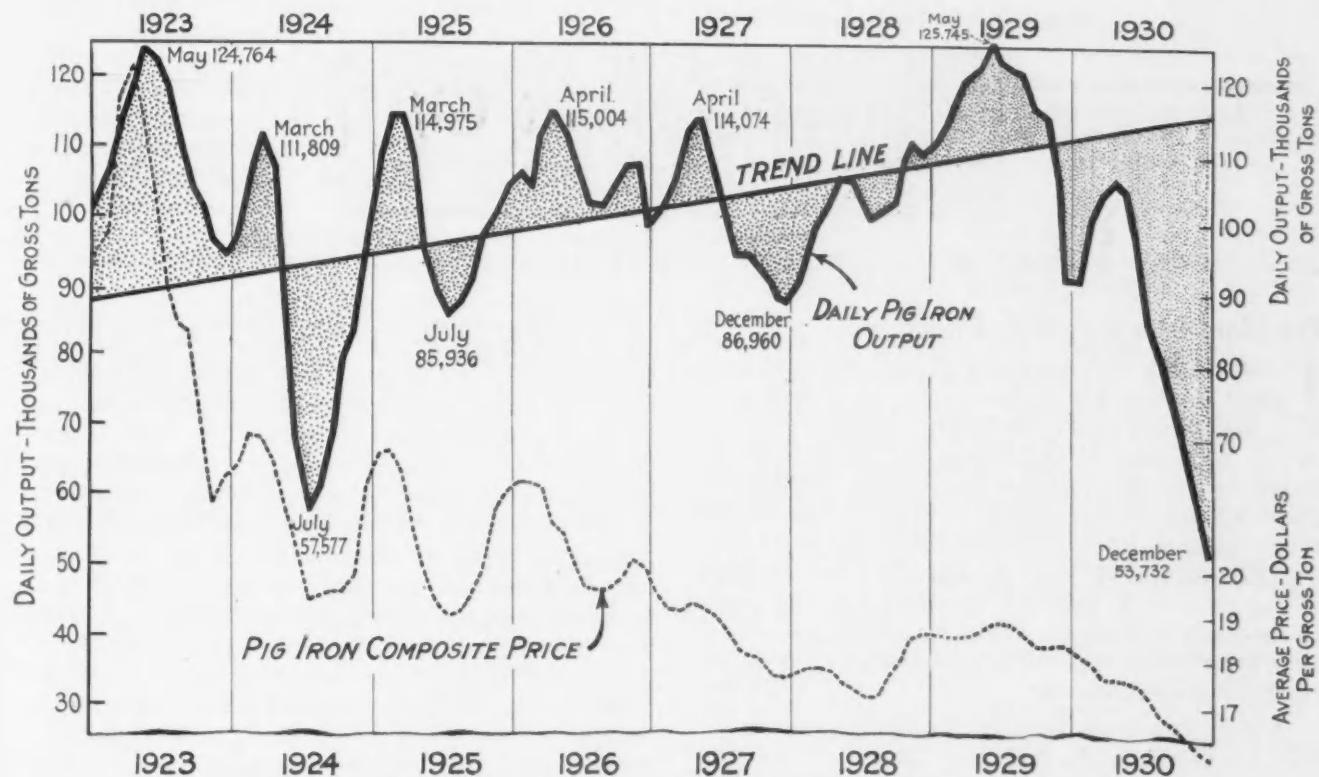
	Jan. 1		Dec. 1	
	Number in Blast	Rate of Operation	Number in Blast	Rate of Operation
New York:				
Buffalo	4	2,375	5	3,375
Other N. Y. and Mass.	2	540	2	590
New Jersey	0	...	0	...
Pennsylvania:				
Lehigh Valley	4	1,465*	4	1,245*
Schuylkill Valley	2	900	2	860
Susquehanna Valley	1	600	1	550
Ferromanganese	0	...	0	...
Lebanon Valley	0	...	0	...
Ferromanganese	0	...	0	...
Pittsburgh District	19	10,500	21	13,000
Ferromanganese	2	300	2	310
Shenango Valley	2	1,155	3	1,700
Western Pennsylvania	3	1,575	2	1,050
Ferromanganese	0	...	1	215
Maryland	2	1,420	2	1,505
Wheeling District	5	900	5	3,560
Ohio:				
Mahoning Valley	3	1,525	6	4,300
Central and Northern	9	5,470	9	5,310
Southern	3	845	3	890
Illinois and Indiana	17	11,620	19	13,190
Mich., Wis. and Minn.	4	1,855	4	1,945
Colo., Mo. and Utah	3	1,090	4	1,575
Ferromanganese	0	...	0	...
The South:				
Virginia	0	0	1	200
Ferromanganese	1	100	1	95
Kentucky	1	375	0	...
Alabama	8	4,020	10	4,740
Ferromanganese	0	...	0	...
Tennessee	0	...	0	...
Total	95	51,330	107	60,205

\*Includes spiegeleisen.

Production of Coke Pig Iron in United States by Months Beginning Jan. 1, 1928—Gross Tons

	1928	1929	1930
Jan.	2,869,761	3,444,370	2,827,464
Feb.	2,900,126	3,206,185	2,838,920
Mar.	3,199,674	3,714,473	3,246,171
Apr.	3,185,504	3,662,625	3,181,368
May	3,283,856	3,898,082	3,232,760
June	3,082,000	3,717,225	2,934,129
1/2 year	18,520,921	21,640,960	18,261,312
July	3,071,824	3,785,120	2,639,537
Aug.	3,136,570	3,755,680	2,523,921
Sept.	3,062,314	3,497,564	2,276,770
Oct.	3,373,806	3,588,118	2,164,768
Nov.	3,302,523	3,181,411	1,867,107
Dec.	3,369,846	2,836,916	1,665,690
Year*	37,837,804	42,285,769	31,399,105

\*These totals do not include charcoal pig iron. The 1929 production of this iron was 138,193 gross tons.



Daily production of pig iron is now proportionally somewhat further below needs than in 1924

Inclined line represents the gradually increasing theoretical needs of the country, ascertained by a balancing of the ups and downs in production. It shows an average yearly increase in consumption of about 1,275,000 tons

were shut down and four put in blast, a net loss of four. The net loss since March has been 90 furnaces.

#### Operating Rate on Jan. 1

Estimated operating for the 95 furnaces active on Jan. 1 was 51,330 tons per day, as compared with 60,205 tons per day for the 107 furnaces blowing on Dec. 1.

Of the 14 furnaces shut down and inactive on Jan. 1, six belonged to independent steel companies, four to the Steel Corporation and four were merchant. One Steel Corporation furnace

was blown in during December and one independent steel company stack. The net loss in steel-making furnaces was eight for December.

The low operating rate on Jan. 1 and the large net loss in furnaces is largely due to temporary banking. Some of these stacks will have probably become active early this month.

#### Furnace Changes in December

Only two furnaces were blown in during December: The Ashland furnace of the American Rolling Mill Co. in Kentucky, and No. 4 Ensley fur-

nace of the Tennessee Coal, Iron & Railroad Co. in Alabama.

Furnaces blown out or banked during December and inactive on Jan. 1 were the following: Harriet Y furnace of the Wickwire Spencer Steel Co. in the Buffalo district; one Duquesne furnace of the Carnegie Steel Co. and one Aliquippa furnace of the Jones & Laughlin Steel Corp. in the Pittsburgh district; the Pulaski furnace in Virginia; two Campbell and one Hubbard furnace of the Youngstown Sheet & Tube Co., Mahoning Valley; one Shenango furnace in the Shenango Valley; one South Chicago furnace of the Illinois Steel Co. and one Gary furnace in the Chicago district; one furnace of the Colorado Fuel & Iron Co. in Colorado; one Pioneer furnace of the Republic Iron & Steel Co.; No. 3 furnace of the Sloss-Sheffield Steel Co., and one Ensley furnace of the Tennessee Coal, Iron & Railroad Co. in Alabama.

New Jersey Steel Co., Camden, N. J., has completed a new warehouse at 1171 Chestnut Street, that city, where it will carry a complete line of hot-rolled bars, sheets, plates, structural shapes, boiler tubes, welding rods, and cold-rolled steel. This company announces that it will handle exclusively the products of American mills.

#### Production of Steel Companies for Own Use—Gross Tons

	Total Pig Iron			Ferromanganese*		
	Spiegel and Ferromanganese	1928	1929	1930	1928	1929
Jan.	2,155,133	2,651,416	2,214,875	22,298	28,208	27,260
Feb.	2,274,880	2,498,901	2,284,234	19,320	25,978	21,310
Mar.	2,588,158	2,959,295	2,600,980	27,912	24,978	23,345
Apr.	2,555,500	2,826,028	2,564,681	18,405	22,413	27,777
May	2,652,872	3,105,404	2,618,628	29,940	25,896	30,296
June	2,448,905	2,999,798	2,304,223	32,088	33,363	27,327
1/2 year	14,675,448	17,040,842	14,582,621	149,963	160,836	157,325
July	2,464,896	3,039,370	2,075,414	32,909	31,040	17,728
Aug.	2,561,904	3,065,874	2,010,572	24,583	28,461	20,909
Sept.	2,477,695	2,862,799	1,870,269	22,278	27,505	21,181
Oct.	2,729,589	2,902,960	1,791,421	23,939	31,108	24,480
Nov.	2,654,211	2,498,291	1,491,927	29,773	31,866	18,619
Dec.	2,647,863	2,112,704	1,269,529	28,618	28,564	16,288
Year	30,211,606	33,522,840	25,101,753	312,063	339,380	276,530

\*Includes output of merchant furnaces.

W. W. MACON  
*Editor*

# THE IRON AGE

A. I. FINDLEY  
*Editor Emeritus*

(ESTABLISHED 1855)

## For More Directors Who Direct

JUDGE JENKINS'S decision against the Bethlehem Sheet & Tube Co. merger, given at Youngstown, Ohio, last week, is a notable addition to the bulky 1930 catalog of lessons of the depression. It is true that proposals for the consolidation of the Youngstown Sheet & Tube Co. with one or more large independent steel companies were actually worked upon while prosperity abounded. It may be, also, that the adequacy of the price to be paid for the properties and assets of the Sheet & Tube Co. would have been just as bitterly fought over had the sale been negotiated at the height of good times.

But as one reads between the lines of this carefully stated opinion he finds that the court's criticism of the procedure of the Sheet & Tube Co. directors is no less a criticism of what has happened over and over again in directors' rooms of large corporations. The decision thus takes its place with the voluminous literature of 1930 dealing with things in the structure and administration of American business which the chastened thinking of this past year of adversity has marked for change. The Ripley campaign in behalf of railroad stockholders had its good side. Moreover, we shall have sounder banking as compensation for the misfortunes of thousands of depositors in the past two years. Similarly in the ordeal through which industry is passing there will be offsetting gains if the directors of big business acquire a deeper sense of their responsibility to their thousands of stockholders and to the community.

In the eye of the Youngstown judge the failure of certain directors of the Sheet & Tube Co. to inform themselves on the merits of the Bethlehem proposal, also what the court calls their lack of opportunity for investigation, was outstanding in the transaction. The court in this connection strongly emphasizes the representative character of the directors of a corporation.

They could not waive their rights; those rights were not personal, they were representative. It is not a question of mere majority action; it is informed action of every director, whether affirmative or negative, and qualified by investigation and knowledge to deem the consideration, terms, etc., expedient. The corporation and its shareholders were entitled to those directors' separate judgment, their arguments when fully informed, as well as to those of a favorable majority. Each of them and all the shareholders have an absolute right to this. \* \* \*

The shareholders, as owners, had an absolute right to have that full and complete accurate information which was necessary to render their authorization or ratification effective. This does not mean at all that, if so informed, they would necessarily disapprove.

With the coming of billion-dollar corporations into American business and the rapid multiplication of those counting their resources by hundreds of millions, there has been not an increasing but rather a decreasing sense of directoral responsibility. The dummy director is by no means confined to the small corporate structure that succeeded the old-time partnership. Too often he sits on boards whose decisions affect tens of thousands of stockholders. And a depression in which millions of American investors have seen their holdings shrink unbelievably has been to many of these investors a severe test of their confidence in the ability of corporate management. The opinion just given by the Ohio court, which in no way reflects on the motives of any party to the controversy, will serve a good end in restoring confidence if it brings home to every corporation director the duty of thoroughly informing himself on the merits of every proposal submitted for his approval. It may indeed help to raise a good many directors' meetings above the level of perfunctory ratifications of what one or two or three minds have scheduled.

In his comments on the clouding of the accounting issues raised in the long-drawn hearings, Judge Jenkins touched on a moot subject to which steel company executives have given much thought. The lack of uniform practice and the arbitrary treatment of accounting items seriously clogged the Youngstown proceeding. The court suggests that cognate industries, in cooperation with the accounting profession, set up uniform standards of comparison of accounts, earnings and values for the guidance of directors and stockholders, as well as of investors generally.

Directors, shareholders and, incidentally, courts should have a clear, explicit presentation of the accounting facts relating to corporations in form and language which, in accordance with common sense, will enable the ordinary reader, without hiring a technical interpreter, to determine the actual state of the corporation's business, prospects and values. Corporate statements and reports are for the information of laymen, not of skilled accountants. Such purpose being so fulfilled, a repetition of the months spent in this case, with the use of language and schedules that not even skilled executives in the corporations involved could understand, would be done away with.

From the beginning the Youngstown controversy has been looked upon in the steel industry as unrelieved misfortune, costly and hurtful, as all war is. The ultimate outcome of the issues as made up for adjudication by the courts is still in the realm of conjecture. However, last week's decision gives reason for believing that there will be substantial salvage from the enormous cost of this litigation. It

should help in no small way to increase the tribe of the thinking director, the representative of the informed stockholder. Seeing that leaders of industry are striving as never before for wide diffusion of stock ownership, they must take every care to guard against over-concentration of power. Also, as the Ohio court well says, high finance and high accountancy must learn more and more to express themselves in language that reveals rather than conceals the condition of a corporation and the value of its securities.

Directors who direct and financial statements that clarify rather than obscure will go far in restoring the confidence of investors that has been so roughly shaken by many developments of the year just closed.

### Instalment Selling for Machine Tools

**A**N interesting experiment is being inaugurated by one of the large machine tool companies in the adoption of a deferred payment plan for the sale of its production machinery. Instalment selling of machine tools has not been unknown, but has applied to a small part of the business done. When deferred payment terms have been granted, they have usually been to companies whose capital resources are not large but of whose honesty and soundness there has been little or no question.

But the application of this principle to all buyers is a unique departure. If it proves to be successful in the case of the pioneer in the movement, the adoption of the deferred payment plan by other companies can easily be foreseen. Important changes in sales policies within an industry have usually begun with an experiment by a bold spirit willing to try a new idea that looked promising.

Though the deferred payment method of selling machine tools has not heretofore been adopted as a definite sales policy, it has been widely discussed. In a general way a good many machine tool builders have been opposed to the plan and have used it only in isolated instances because of special circumstances. The efforts of the American buying representative of Soviet Russia to obtain long-term credits in the purchase of machine tools have focused attention on the subject perhaps more than any other one thing. Russia has insisted upon, and, in many instances, has obtained credits running as long as a year. Some machine tool companies, however, have declined such business except upon cash payments and, in justification of this attitude, have pointed to the fact that similar purchasing arrangements were not open to American buyers.

The success of the deferred payment plan in the machine tool trade is yet to be proved, but it is reasonable to suppose that a considerable number of manufacturers will be interested in the opportunity to pay for shop equipment out of the earnings of the equipment itself. The instalment plan of buying has become so deeply rooted in the American mind that its adoption in the machine tool industry is surprising only because it has been delayed so long. Many other kinds of machinery have for some time been sold on long-term payments.

### Scant Supply of 1931 Forecasts

**I**T is notable, although not strange, that there has been a meager supply of forecasts as to business conditions in the year 1931, now happily entered in that a year of unhappiness has been left behind. From the usual showing there has been some decrease in volume and a large decrease in preciseness. The financial editor of the *New York Evening Post* sums the matter up under six heads, observing that many men high in executive authority refused to predict, Government officials were more reticent than usual and commentators who have expressed themselves freely have become very reserved.

This, however, is all as it should be. It is easier and more natural to predict a continuance of good times than of poor times. People are indisposed to find fault with good times, for if they had thought them wrong their business conduct would have prevented their being so good. With bad times they do find fault, but it is not easy to guess when the fault will be corrected.

There is no magic in hanging up a new calendar or closing the books for the old year. There is a physical influence in that the winter solstice was passed 17 days ago, the sun beginning its six months' movement north, but that is seasonal, not affecting the whole year since another winter solstice will have been reached before the year closes.

When predictions for the year are made, an awkward circumstance is that if the forecaster himself does not compare directly with the preceding year the reader is likely to do so, and in this case only confusion results for 1930 was made up of very different parts. Repeatedly in steel trade circles opinion has been solicited as to how 1931 is likely to compare with 1930, whereas a specific opinion is impossible, for 1930 cannot be regarded as an entity. A computation based on steel ingot production brings out this point clearly and forcibly. Last year's total was about 40,000,000 tons, divided 60 per cent first half and 40 per cent second half, or one-third decrease, and the fourth quarter was little over 55 per cent of the first quarter. To provide a more precise showing, computations have been made of the average percentage distribution, by quarters, of production in the four years 1925 to 1928 inclusive, the distribution in 1930 and the variation from the average, as follows:

#### STEEL INGOT PRODUCTION BY QUARTERS

	1925-1928 Average Per Cent	1930 Per Cent	Divergence From Average Per Cent
First .....	26.7	30.8	+15
Second .....	25.3	29.2	+15
Third .....	23.5	22.5	-4
Fourth .....	24.5	17.5	-29
Total .....	100.0	100.0	

The first two quarters of last year ran in usual proportion to each other, the last two quarters showed progressive diminution from average. It makes such a big difference what part of 1930 is taken that a prediction can be made, in all probability correct but entirely unilluminating, that 1931 ingot production will be less than 48,000,000 tons, which was the rate in the first half of 1930, and above 28,000,000 tons, the approximate rate in the last quarter.



## Let's Talk Better Times

By JAMES A. FARRELL

President, United States Steel Corporation



DEPRESSIONS thrive on pessimism and fear. But they are not invulnerable. They cannot survive courage and faith.

Our consumption excesses of 1929 are apparently cleared away. Price declines have given the dollar a purchasing power that is now greater than it has been for more than a decade. Money we have in abundance, seeking employment at the lowest rates obtainable in the last quarter century. Obsolescence and wear, together with deferred buying, have built up a high level of potential demand.

The chief obstacle to recovery is now the state of mind. Too many of us have become depression-minded. The well-to-do and those who have jobs wear longer faces than do the unemployed.

Cheerfulness is contagious, as well as pessimism. We cannot laugh away a depression, but we can spread the germs of cheerfulness with smiles.

As Mr. Farrell says, in this article published in the January Rotarian, "Let's quit harping upon depression. Let's talk better times."



against him are altogether too great. This is a time in which the constructive, cooperative effort of everyone from clerk to executive is essential.

I believe that, as the years go by, appreciation of the finer relationships of business will increase, confidence in one another will be broadened, fairness to all will become second nature, and as a result industry will improve its own condition by better serving the public welfare.

And—let's quit harping upon depression. Let's talk better times.

DURING the past year we have faced a general business depression. This was but a logical outcome following the activity of 1929. Production in nearly all industries has declined materially, but I am one of those who like to think that business has been making for better times—this in view of the wider demand for manufactured articles of higher quality.

The millions spent and being expended in modernizing plants to reduce costs will be justified by the inevitable return of a period when demand will again overtake supply.

While competition in industry may be termed euphemistically the "life of trade," it must be healthy competition, because, carried to the excess which leads to destruction of competitors, it is harmful to business and destructive of prosperity. The middle ground must be found in legitimate cooperation combined with legitimate competition.

Business can never exist without a fair profit. When profits disappear, business likewise disappears. The satisfaction of labor working for adequate wages, of the consuming public for an adequate supply of goods at reasonable prices, of the investor for a fair return on his money, of the government for an unimpaired source

of tax returns, are all dependent upon profitable operation of business.

Business management is in duty bound to apply scientific thinking and planning in effecting better methods for the stabilizing of business prosperity.

By cooperative effort we have effected economies through standardization, simplification, and the elimination of waste. Inefficient plants and unfair selling methods are still a part of many industries, but unfair and high-pressure sales efforts will never offset the failings brought about by plants that are inefficient. Changing conditions and accelerated methods are forcing the transition to modernized plants and improved commercial practices.

Eventually business concerns will see the need of determining accurate costs and of establishing their sales prices on a basis of total cost plus a reasonable profit. This is the only procedure by which business can permanently endure, and it is the first essential of sound, intelligent management.

Public opinion cannot be artificially manufactured. Advertising and publicity alone, no matter how skilfully handled, will not achieve anything of lasting value unless founded upon sound economic principles. Public confidence can be maintained only if actual achievement accompany announcements and claims.

ALL industry throughout the world has been passing through a transition that has affected prices and this is due largely to the fall in values of basic commodities and to the underlying world causes for such decline. I am confident that in the end, stabilization and recovery will develop from intelligent management. The "Spirit of Live and Let Live" is a necessary doctrine of modern business, and no satisfactory substitute has been found for the Golden Rule.

The benefits to be derived through proper cooperative efforts should be apparent to every manufacturer whose efforts are meeting with success. It should demonstrate that individual success and prosperity are based primarily upon the prosperity of industry itself. No individual can possibly achieve permanent success if exclusive reliance is to be placed upon individual effort. The forces marshalled

# Steel Plant Operations Recover Ground Lost in December

THE passing of the holidays has brought an encouraging upturn of activity in the iron and steel industry. Steel ingot production, at 41 per cent of capacity, has recovered all of its December losses, now being at virtually the same rate as in the closing week of November. Blast furnaces which were temporarily banked late last month are being brought back into service.

Much of the current improvement in operations is due to January shipping orders placed in December, but a fair volume of releases since the first of the year and a gain in the number of inquiries point to continued expansion of demand, in line with normal seasonal tendencies.

AUTOMOBILE steel, railroad steel, tin plate and structural tonnage are contributing most to current mill activity, but a general upswing in demand is looked for to compensate for drastic inventory reduction in the closing month of 1930. The extraordinary pressure that buyers brought to bear on stocks is indicated by the fact that the December shipments of a large sheet producer were the smallest for any month since July, 1921.

Betterment in motor car production is more rapid than the steel industry had expected. Automobile output in the United States and Canada in December was 150,000 units, a gain of 16,000 over the total for November, thereby reversing the seasonal trend for the first time in many years. The increase was made despite suspensions by Ford and other large manufacturers late in the month and was due, in large part, to Chevrolet's production of 64,000 cars. The Chevrolet company will continue to expand its operations, now engaging well over 30,000 workers, until 40,000 are employed. Meanwhile, resumptions by other motor car makers have put 22,000 men back to work.

PIG iron production in December was 1,665,690 tons, or 53,732 tons a day, compared with 1,867,107 tons, or 62,237 tons daily, in November. The per diem rate fell 13.7 per cent under that of the previous month and was the lowest since January, 1922. Fourteen furnaces were taken out of blast and two were lighted, a net loss of 12. On Jan. 1 there were 95 stacks active, or 90 fewer than on April 1 at the inception of the uninterrupted decline in pig iron output. Production for 1930, totaling 31,399,105 tons, was 25.7 per cent smaller than the record 1929 output.

STEEL Ingot Output Now 41 Per Cent of Capacity—  
Pig Iron Production Off 13.7 Per Cent in December

Steel ingot production in December, at 77,222 tons a day, showed a decline of 13.6 per cent from November and reached the lowest level since July, 1924. Output for the year was 39,652,539 tons, to which electric and crucible ingots will add about 350,000 tons. The reduction from the record total of 1929 was nearly 27 per cent.

TIN plate production now averages 60 per cent, compared with 50 per cent a week ago.

A contract for 50,750 tons of rails placed by the Louisville & Nashville with the Alabama producer has been supplemented by orders for 10,000 tons of track accessories. The Ensley rail mill will resume operations Jan. 12. Chicago district rail mills are running at 50 to 55 per cent of capacity, following holiday shutdowns. Purchases of steel and equipment by railroads east of the Mississippi River will expand materially, it is predicted, if the proposed quadruple consolidation plan is approved by the Interstate Commerce Commission.

Structural steel awards, at 37,000 tons, are well above the weekly average of the past few months. Pending work has been augmented by fresh inquiries for 28,500 tons. Current structural activity is featured by public projects.

Four large ships have been awarded by the Panama Mail Steamship Co. to the Federal Shipbuilding Co. The total construction cost will be \$17,000,000.

SCRAP markets, still sluggish, are without a uniform trend. Heavy melting grade has advanced 50c. a ton at Pittsburgh and \$1 a ton at Birmingham, but has declined 25c. at St. Louis and 50c. at Philadelphia.

Finished steel prices show greater firmness. Makers of cold-finished steel bars have announced a new price of 2.10c. a lb., an advance of \$2 a ton. Likewise producers of plates, shapes and bars are asking 1.65c., Pittsburgh, on new business, but contract coverage at 1.60c. has been so widespread that there will probably be no real test of the higher figure for several weeks.

THE IRON AGE composite price for heavy melting scrap has advanced to \$11.33 a ton, after holding at \$11.25 for a month. The finished steel and pig iron composites are unchanged at 2.121c. a lb. and \$15.90 a ton respectively.

# PITTSBURGH

## Steel Companies Expect Heavier Tonnage Releases This Month—Scrap Higher

**P**ITTSBURGH, Jan. 6.—While the steel industry has experienced the usual January rebound from the low point reached during the holidays, definite evidence of substantial improvement has not appeared. Sentiment in the trade is greatly improved, and local steel companies believe that tonnage releases will be substantially heavier before the middle of the month. At present, specifications, though numerous, are confined to rather small lots and are coming from miscellaneous sources rather than from any particular consuming industry.

Automobile makers seem to offer the best prospect for material increases in tonnage before the end of the month, with present manufacturing schedules being stepped up rapidly at a number of plants. Business from the railroads also offers promise, and local mills are already engaged in rolling against orders for freight car steel placed late in the year. Rail mill operations show little change as yet, and may not reach substantial proportions before February.

Open-hearth operations have regained losses sustained during the last two weeks of December, and seem to be slightly higher than in the early part of last month. With the leading interest running at about 50 per cent of capacity, the district as a whole averages about 40 per cent and present plans call for further increases before the end of the week. This is also true in the case of idle blast furnaces, particularly those which were banked late in December. An independent company in the district will put on a blast furnace Jan. 15, and other stacks may be relighted before that time.

The largest gains in finishing mill schedules are in tin plate, the average for that department now standing at approximately 60 per cent of capacity. Two or three large independent companies have full operations scheduled for this week. Improvement in sheet and strip production has been more limited, but sheet units are now engaged at 40 to 45 per cent, with strip mills slightly lower. Plate mills are also engaged at a higher rate than they were before holiday suspensions, and other finishing departments have again resumed work at approximately the rate which prevailed early in December.

The price structure continues to gain stability. In many lines shipments against old low-priced contracts were completed before the year-end, and present billing prices are sub-

Rebound in steel operations from low point of December occurs, but average rate is not much, if any, above 40 per cent for district.

Steel specifications, though numerous, are confined mostly to small lots.

Bars, plates and shapes are now firmly quoted at 1.65c., following extensive contract coverage at 1.60c. Cold-finished steel bars advanced \$2 a ton.

Automobile industry seems to offer best prospect for increased steel consumption within immediate future.

Heavy melting steel sold to three consumers at \$13.50, representing 50c. a ton advance in average price.

stantially higher on some products, notably plates and shapes. The 1.65c., Pittsburgh, quotation on heavy hot-rolled products is being applied currently on small tonnages, although first quarter contracts generally carry the 1.60c. figure which prevailed prior to the December advance. Makers of cold-finished steel bars have announced an increase of \$2 a ton, bringing their quotations to 2.10c., Pittsburgh. First quarter business previously taken was principally on the basis of 2c., Pittsburgh. On sheets and strip quotations have gained stability, and price shading is uncommon.

An advance of 50c. a ton on No. 1 heavy melting steel has given the market on basic materials a firmer tone, although pig iron continues rather dull.

### Pig Iron

While shipments of foundry iron have reflected a slight gain since the first of the year, consumer requirements thus far have been rather disappointing. The market still lacks substantial inquiries, and current sales are in small lots for immediate shipment. No merchant furnaces have resumed operations as yet, although stocks are low at some points and production may be increased before the end of the month. Prices are unchanged at \$17, Valley furnace, for foundry iron and at

\$17.50 for malleable and Bessemer. The market on basic is still quotable at \$17, although no sales have been made to test this figure. The Pittsburgh furnace is quoting prices 50c. a ton higher.

*Prices per gross ton, f.o.b. Valley furnace:*  
Basic ..... \$17.00  
Bessemer ..... 17.50  
Gray forge ..... 16.50  
No. 2 foundry ..... 17.00  
No. 3 foundry ..... 16.50  
Malleable ..... 17.50  
Low phosphorus, copper free ..... \$26.66 to 27.00

Freight rate to Pittsburgh or Cleveland district, \$1.76.

*Prices per gross ton, f.o.b. Pittsburgh district furnace:*  
Basic ..... \$17.50  
No. 2 foundry ..... 17.50  
No. 3 foundry ..... 17.00  
Malleable ..... 18.00  
Bessemer ..... 18.00

Freight rates to points in Pittsburgh district range from 63c. to \$1.13.

### Semi-Finished Steel

With scarcely any consumer buying of billets, slabs or sheet bars, the market still lacks a definite price test, but most sellers now admit a nominal quotation of \$30, Pittsburgh. While it is understood that some distress material was disposed of last month at a considerably lower figure, the regular market can hardly be said to be affected. Shipments continue rather light, although some of the smaller non-integrated steel companies have increased their releases in the last week.

### Rails and Track Accessories

Announcement of the rail distribution of the Pennsylvania Railroad is expected soon. Several roads are in the market for miscellaneous tonnages of track accessories which will be closed during the month. The local rail mill is gradually stepping up its operations, although track accessory capacity is engaged at no higher a rate than that which has prevailed for several weeks.

### Bars, Shapes and Plates

Low-priced tonnage on fourth quarter commitments was largely ordered out before the end of December. For the first quarter there has been widespread contract coverage at 1.60c., Pittsburgh, but on miscellaneous small lots the mills are now insisting on 1.65c. Although specifications from the automobile industry seem to be increasing, demand from other sources does not yet show any marked change and it will be two weeks before the full extent of expected January improvement can be accurately gauged.

The plate market is featured by the

# A Comparison of Prices

Market Prices at Date, and One Week, One Month and One Year Previous,  
Advances Over Past Week in Heavy Type, Declines in Italics

	Jan. 6,	Dec. 29,	Dec. 9,	Jan. 7,
Pig Iron, Per Gross Ton:	1931	1930	1930	1930
No. 2 fdy., Philadelphia	\$17.76	\$17.76	\$17.76	\$20.76
No. 2, Valley furnace	17.00	17.00	17.00	18.50
No. 2 Southern, Cin'ti	14.19	14.19	14.69	17.69
No. 2 Birmingham	14.00	14.00	14.00	14.50
No. 2 foundry, Chicago*	17.50	17.50	17.50	20.00
Basic, del'd eastern Pa.	17.75	17.75	17.75	19.50
Basic, Valley furnace	17.00	17.00	17.00	18.50
Valley Bessemer, del'd P'gh	19.26	19.26	19.26	20.76
Malleable, Chicago*	17.50	17.50	17.50	20.00
Malleable, Valley	17.50	17.50	17.50	19.00
L. S. charcoal, Chicago	27.04	27.04	27.04	27.04
Ferromanganese, furnace	80.00	80.00	80.00	100.00

## Rails, Billets, Etc., Per Gross Ton:

	Jan. 6,	Dec. 29,	Dec. 9,	Jan. 7,
Rails, heavy, at mill	\$43.00	\$43.00	\$43.00	\$43.00
Light rails at mill	36.00	36.00	36.00	36.00
Rerolling billets, Pittsburgh	30.00	30.00	31.00	34.00
Sheet bars, Pittsburgh	30.00	30.00	31.00	34.00
Slabs, Pittsburgh	30.00	30.00	31.00	34.00
Forging billets, Pittsburgh	36.00	36.00	36.00	39.00
Wire rods, Pittsburgh	35.00	35.00	35.00	40.00
Cents	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.60	1.60	1.60	1.85

## Finished Steel,

	Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Bars, Pittsburgh		1.60	1.60	1.60	1.90
Bars, Chicago		1.70	1.70	1.70	2.00
Bars, Cleveland		1.65	1.65	1.65	1.90
Bars, New York		1.93	1.93	1.93	2.24
Tank plates, Pittsburgh		1.60	1.60	1.60	1.90
Tank plates, Chicago		1.70	1.70	1.70	2.00
Tank plates, New York		1.88	1.88	1.88	2.12 1/2
Structural shapes, P'gh		1.60	1.60	1.60	1.90
Structural shapes, Chicago		1.70	1.70	1.70	2.00
Structural shapes, New York		1.85 1/2	1.85 1/2	1.85 1/2	2.09 1/2
Cold-finished bars, Pittsburgh		2.00	2.00	2.00	2.30
Hot-rolled strips, Pittsburgh		1.55	1.55	1.55	1.80
Cold-rolled strips, Pittsburgh		2.25	2.25	2.25	2.65

\*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Inland Waterways Corp.'s barge inquiry, against which bids were taken last week. While the number of barges to be bought has been reduced from 50 to 40, approximately 25,000 tons of plates will still be required and the business is expected to be allocated among several builders before the end of the week. Local mills are also beginning to ship against recent railroad orders for plates, and production shows considerable improvement.

Structural steel activity in this district is still rather limited, although some fair-sized projects are in prospect. Bids are expected to be asked within the next two months on the Pittsburgh Postoffice, which will take a round tonnage of steel. Other important work is in prospect, although still in the formative stage. The Arsenal High School in Pittsburgh will require about 600 tons of shapes, and an addition to the plant of the United Engineering & Foundry Co. at Canton, Ohio, requiring 600 tons, has been let.

## Cold Finished Steel Bars

Makers of cold-finished steel bars last week announced a minimum price of 2.10c., Pittsburgh and other basing

points, on all current and contract tonnage. While a number of users had been able to cover at 2c. before the advance, the new price is being maintained on current spot purchases.

## Bolts, Nuts and Rivets

Business during the last week has shown a slight quickening in some quarters. Most of the improvement can be traced to the automobile industry, although movement to railroads is on the increase, and demand from the structural steel fabricators is well maintained.

## Tubular Goods

Production of pipe has been resumed by most of the seamless and electric welding mills in the district, although lapweld capacity continues idle at most plants. Butt weld units are running at about 30 per cent, but slightly increased specifications in the last month may enable a slight increase in the near future. Distributor inventories on butt weld material have been allowed to get very low and will be built up to some extent in spite of sluggish current demand. Companies making line pipe

	Jan. 6,	Dec. 29,	Dec. 9,	Jan. 7,
Finished Steel,	1931	1930	1930	1930
Per Lb. to Large Buyers:				
Sheets, black, No. 24, P'gh	2.35	2.35	2.35	2.75
Sheets, black, No. 24, Chicago				
dist. mill	2.45	2.45	2.45	2.85
Sheets, galv., No. 24, P'gh	2.90	2.90	2.95	3.40
Sheets, galv., No. 24, Chicago				
dist. mill	3.00	3.00	3.10	3.50
Sheets, blue, No. 13, P'gh	2.05	2.05	2.05	2.25
Sheets, blue, No. 13, Chicago				
dist. mill	2.15	2.15	2.15	2.45
Wire nails, Pittsburgh	1.90	1.90	1.90	2.40
Wire nails, Chicago dist. mill	1.95	1.95	1.95	2.45
Plain wire, Pittsburgh	2.20	2.20	2.20	2.40
Plain wire, Chicago dist. mill	2.25	2.25	2.25	2.45
Barbed wire, galv., P'gh	2.55	2.55	2.60	3.05
Barbed wire, galv., Chicago				
dist. mill	2.60	2.60	2.75	3.10
Tin plate, 100 lb. box, P'gh	\$5.00	\$5.00	\$5.00	\$5.25

## Old Material, Per Gross Ton:

Heavy melting steel, P'gh	\$13.25	\$12.75	\$12.75	\$16.75
Heavy melting steel, Phila	10.50	11.00	11.00	14.50
Heavy melting steel, Ch'go	10.25	10.00	10.00	12.75
Carwheels, Chicago	11.25	11.75	11.75	13.75
Carwheels, Philadelphia	14.00	14.00	14.00	15.00
No. 1 cast, Pittsburgh	12.50	12.50	12.50	14.50
No. 1 cast, Philadelphia	12.00	12.00	12.00	15.00
No. 1 cast, Ch'go (net ton)	9.50	9.50	9.50	13.50
No. 1 RR. wrot., Phila	13.50	13.50	13.50	15.00
No. 1 RR. wrot., Ch'go (net)	8.50	8.50	8.50	12.00

## Coke, Connellsville,

Per Net Ton at Oven:

Furnace coke, prompt	\$2.50	\$2.50	\$2.50	\$2.60
Foundry coke, prompt	3.50	3.50	3.50	3.50

## Metals,

	Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York		10.62 1/2	10.62 1/2	12.12 1/2	18.12 1/2
Electrolytic copper, refinery		10.25	10.25	10.75	17.75
Tin (Straits), New York		26.62 1/2	26.87 1/2	25.00	39.62 1/2
Zinc, East St. Louis		4.10	4.12 1/2	4.20	5.30
Zinc, New York		4.45	4.47 1/2	4.55	5.65
Lead, St. Louis		4.80	4.95	4.95	6.10
Lead, New York		5.00	5.10	5.10	6.25
Antimony (Asiatic), N. Y.		7.30	7.10	7.10	8.37 1/2

have been rather busy with tentative quotations on some of the projects in consideration, although none of them seems to be very near to the letting stage. In some cases franchises have not yet been granted and some lines have been mentioned for which the supply of gas is far from adequate. The probability of much line pipe tonnage being placed before spring is doubted by part of the trade who feel that the country's capacity is now much too large to suggest difficulties in getting shipments at the desired time.

## Wire Products

The merchant trade is beginning to increase its specifications, but improvement in demand from manufacturers is still limited. Most of the requirements of jobbers have come as a result of year-end inventories and are principally in the form of small tonnages.

## Sheets

Another week will have to pass by before the full extent of the recovery in demand can be estimated. While specifications last week showed some improvement over the holiday period

## THE IRON AGE COMPOSITE PRICES

### Finished Steel

Jan. 6, 1931  
One week ago  
One month ago  
One year ago

2.121c, a Lb.  
2.121c.  
2.121c.  
2.362c.

Based on steel bars, beams, tank plates, wire, rails, black pipe and sheets. These products make 87 per cent of the United States output.

1930.....  
1929.....  
1928.....  
1927.....  
1926.....  
1925.....

HIGH  
2.362c., Jan. 7; 2.121c., Dec. 9  
2.412c., April 2; 2.362c., Oct. 29  
2.391c., Dec. 11; 2.314c., Jan. 3  
2.483c., Jan. 4; 2.393c., Oct. 25  
2.433c., Jan. 5; 2.403c., May 18  
2.560c., Jan. 6; 2.396c., Aug. 18

LOW

### Pig Iron

\$15.90 a Gross Ton  
15.90  
16.02  
18.21

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

HIGH  
\$18.21, Jan. 7; \$15.90, Dec. 16  
18.71, May 14; 18.21, Dec. 17  
18.59, Nov. 27; 17.04, July 24  
19.71, Jan. 4; 17.54, Nov. 1  
21.54, Jan. 5; 19.46, July 13  
22.50, Jan. 13; 18.96, July 7

LOW

### Steel Scrap

\$11.33 a Gross Ton  
11.25  
11.25  
14.50

Based on heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

HIGH  
\$15.00, Feb. 18; \$11.42, Dec. 9  
17.58, Jan. 29; 14.08, Dec. 3  
16.50, Dec. 31; 13.08, July 2  
15.25, Jan. 11; 13.08, Nov. 22  
17.25, Jan. 5; 14.00, June 1  
20.83, Jan. 13; 15.08, May 5

LOW

and reports in the last day or two indicate further gains, the levels reached during December were so low that the month can hardly be taken as a criterion for comparisons. December shipments of one large producer were the lowest in any month since July, 1921, but specifications for January shipment have already been more than twice as large. New contracts were also far larger than shipments with all companies, providing an opportunity to accumulate backlog tonnage which they feel sure will be largely ordered out this quarter. While automobile manufacturers have promised considerably increased releases this month, their tonnage thus far has not been significant and specifications have been principally in small size and from widely diversified consumers. Stability of prices is the most encouraging feature of the market. Business taken at figures under the present levels has now been cancelled or specified against. Scarcely any deviations from 2.35c., Pittsburgh, on black sheets can be reported, although higher figures have disappeared. The range of 2.90c. to 3c. on galvanized is still necessary, but the market on light plates and blue annealed sheets is rather generally 1.90c. and 2.05c., respectively. Only exceptional widths are commanding higher figures. Automobile body sheets are unchanged at 3.30c., Pittsburgh, and steel furniture at 3.60c., but tin mill black is now quoted at 2.60c. to 2.70c.

### Tin Plate

While tin plate production last week was not above 50 per cent of capacity, schedules are higher this week and should average close to 60 per cent. A few of the larger independents plan a capacity operation, and the leading interest will run its mills at slightly less than 55 per cent. Current specifications are gradually improving and anticipated tonnage is still occupying mill with definite outlets.

### Strip Steel

Business shows signs of improvement which have not yet been translated into definitely larger releases. Some makers have had fair releases

from the automotive industry in the last few days, but are generally maintaining production at a minimum in an effort to see a certain improvement before advancing mill operations too sharply. Small orders from miscellaneous sources are up to expectations, but a more marked improvement in the requirements of the leading consuming industry will be required before strip mills can approach a normal operation. Prices are well maintained at 2.25c., Pittsburgh, on cold-rolled material, and at 1.55c. and 1.65c. on hot-rolled.

### Coal and Coke

The usual demand for foundry coke which may be expected at the beginning of a year has not developed in satisfactory proportions. Shipments are little heavier as yet and the furnace coke market continues to be just as dull as it has been.

### Old Material

Sales of No. 1 heavy melting steel to three consumers at \$13.50 have

### Warehouse Prices, f.o.b. Pittsburgh

\*Base per Lb.  
Plates ..... 2.85c.  
Structural shapes ..... 2.85c.  
Soft steel bars and small shapes ..... 2.75c.  
Reinforcing steel bars ..... 2.75c.  
Cold finished and screw stock—  
    Rounds and hexagons ..... 3.35c.  
    Squares and flats ..... 3.85c.  
Bands ..... 3.10c.  
Hoops ..... 4.10c.  
Black sheets (No. 24), 25 or more  
    bundles ..... 3.25c.  
Galv. sheets (No. 24), 25 or more  
    bundles ..... 3.85c.  
Light plates, blue annealed (No.  
    10), 1 to 24 plates ..... 2.75c.  
Blue annealed sheets (No. 13) ..... 2.65c.  
Galv. corrug. sheets (No. 28), per  
    square ..... 4.25c.  
Spikes, large ..... 2.65c.  
    Small ..... 2.90c. to 3.05c.  
Boat ..... 3.15c.  
Track bolts, all sizes, per 100 count,  
    60 and 10 per cent off list  
Machine bolts, 100 count,  
    60 and 10 per cent off list  
Carriage bolts, 100 count,  
    60 and 10 per cent off list  
Nuts, all styles, 100 count,  
    60 and 10 per cent off list  
Large rivets, base per 100 lb. .... \$3.30  
Wire, black, soft ann'l'd, base per  
    100 lb. ..... 2.40  
Wire, galv. soft, base per 100 lb. .... 2.85  
Common wire nails, per keg ..... 2.15  
Cement coated nails, per keg ..... 2.15

\*On plates, structural, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 3999 lb.

established the first advance in scrap prices in many weeks. One consumer is reported to have bought as much as 10,000 tons, while the other purchases were in smaller volume. However, dealers are still having difficulty in interesting steel companies in scrap purchases, and offerings at \$13 have been refused by at least two mills. Scrap can still be bought occasionally at less than \$13, although a few dealers are willing to pay this figure to cover recent sales. Rails and compressed sheets have also reflected the stronger tone in heavy melting steel, and are quoted at 50c. a ton higher on the basis of dealers' buying prices. Low phosphorus scrap is also stronger.

Dealers believe that recent purchases have stimulated interest in the market, and are expecting more sales within the next week. If such business materializes, the scrap market may reflect further advances before the end of the month, although much depends upon the extent of the improvement in open-hearth operations.

*Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:*

#### Basic Open-Hearth Grades:

No. 1 heavy melting steel. \$13.00 to \$13.50  
No. 2 heavy melting steel. 11.00 to 11.50  
Scrap rails ..... 12.50 to 13.00  
Compressed sheet steel ..... 12.50 to 13.00  
Bundled sheets, sides and  
    ends ..... 10.00 to 10.50  
Cast iron carwheels ..... 13.50 to 14.00  
Sheet bar crops, ordinary ..... 13.50 to 14.00  
Heavy breakable cast ..... 9.00 to 9.50  
No. 2 railroad wrought ..... 13.00 to 13.50  
Hvy. steel axle turnings ..... 10.50 to 11.00  
Machine shop turnings ..... 6.00 to 6.50

#### Acid Open-Hearth Grades:

Railr. knuckles and couplers ..... 16.00 to 16.50  
Railr. coil and leaf springs ..... 16.00 to 16.50  
Rolled steel wheels ..... 16.00 to 16.50  
Low phos. billet and bloom  
    ends ..... 17.00 to 18.00  
Low phos. mill plates ..... 16.00 to 16.50  
Low phos. light grades ..... 16.00 to 16.50  
Low phos. sheet bar crops ..... 16.50 to 17.00  
Heavy steel axle turnings ..... 10.50 to 11.00

#### Electric Furnace Grades:

Low phos. punchings ..... 16.00 to 16.50  
Heavy steel axle turnings ..... 10.50 to 11.00

#### Blast Furnace Grades:

Short shoveling steel turnings ..... 7.50 to 8.00  
Short mixed borings and  
    turnings ..... 7.50 to 8.00  
Cast iron borings ..... 7.50 to 8.00

#### Rolling Mill Grades:

Steel car axles ..... 18.00 to 18.50

#### Cupola Grades:

No. 1 cast ..... 12.00 to 13.00

Rails 3 ft. and under ..... 14.00 to 14.50

# CHICAGO

## Slight Gain in Steel Specifications—Pig Iron Shipments Point Upward

CHICAGO, Jan. 6.—Industrial activity gives evidence of pointing upward. Specifications for finished steel products have gained somewhat, but a fair part of this tonnage is for shipment later in the month. New buying for future needs is sluggish, while spot orders are making a better showing than in December.

Several major Western railroads which resumed part-time shop operations late in the old year shut down for the holidays, but now are calling back not only the men employed in December, but also additional shop workers. Several forge shops in this district have increased output slightly and are bidding on work which gives promise of heavier operating schedules in the next few weeks. Road machinery builders continue to hold to a steady pace in anticipation that spring road construction programs will be all that they promise at this time. The near future of the farm implement business is still obscure, and manufacturers of this equipment remain cautious. Although specifications from this source have gained slightly, they are for the most part at extremely close range.

Virtually no headway is being made in the railroad equipment market, but several large railroad bridge undertakings are near at hand and the Santa Fe announces that it will employ several thousand men on replacement of track work.

Steel mill output is responding slowly to the improved outlook in the industrial field. Ingot output has laboriously climbed to 35 per cent of capacity. Mills are subsisting partly on cold pig iron accumulated during the holidays. Two steel mill blast furnaces remain banked, there being 12 lighted of 36 in the district.

### Ferroalloys

Slightly heavier releases from the automobile group is of interest in the week's developments in this market.

### Pig Iron

Releases now on pig iron sellers' books are already larger than the November total, which was well above the figure for December. Many shipping instructions are marked rush, indicating that many consumers have let stocks of pig iron diminish almost to the vanishing point. Forward buying continues at a substantial rate and fresh inquiries are promising. The four local merchant furnaces now in production at 60 per cent of capacity are sold out at this rate for the first quarter. Prices for Northern furnace iron are steady at \$17.50 a

Specifications for finished steel products show slight gain, but many lines still lag.

\* \* \*

Ingot operating rate for this week not above 35 per cent of district capacity.

\* \* \*

Expansion of railroad equipment buying and higher schedules in farm machinery manufacturing delayed.

\* \* \*

Pig iron releases for January shipment show fair upward turn in foundry melt this month.

\* \* \*

Scrap market still dull with prices unchanged.

ton, local furnace. Shading below this figure appears to be limited to iron taken from local docks and a few odd lots of off-grade steel mill pig iron that from time to time reach the open market. Quotations on Southern iron range from \$10.50 to \$11, Birmingham.

Prices per gross ton at Chicago:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	\$17.50
N'th'n No. 1 fdy., sil. 2.25 to 2.75	18.00
Malleable, not over 2.25 sil.	17.50
High phosphorus	17.50
Lake Super. charcoal, sil. 1.50	27.04
S'th'n No. 2 fdy.	17.51
Low phos., sil. 1 to 2 copper free	\$28.50 to 29.20
Silvery, sil. 8 per cent.	26.79
Bess. ferrosilicon, 14-15 per cent	35.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 6c. per gross ton.

### Warehouse Business

Prices of track bolts and spikes have been lowered, and common wire and cement coated nails are being quoted at a flat \$2.30, base, a keg. Quotations now governing on spikes are 3.45c. a lb. and on track bolts 4.30c. Orders placed with warehouses remain spotty and in small aggregate tonnage.

### Cast Iron Pipe

United States Pipe & Foundry Co. was the successful bidder for furnishing Milwaukee 6000 tons of 6 to 16-in. Class C pipe. The price was \$41 a ton, delivered, or \$32.60, Birmingham. This company had also entered a bid of \$42 a ton, delivered, if the order was to be shared with other bidders. It is reported that the United States

company has taken 520 tons of 6 to 24-in. pipe for Saginaw, Mich. Most promising among projects that are taking shape are the plans now being formulated by the sanitary district trustees at Chicago. Inquiries now before the trade, in addition to contemplated new work, give a substantial background to this market. In fact, conditions are measurably better than a year ago.

Prices per net ton, deliv'd Chicago: Water pipe, 6-in. and over, \$43 to \$46; 4-in., \$46 to \$49; Class A and gas pipe, \$3 extra.

### Rails and Track Supplies

The Western rail market is quiet. Inquiries for and sales of both rails and track supplies are limited to miscellaneous small lots that aggregate only a few thousand tons. The trade is hopeful that several major Western railroads will soon enter the market for 1931 rail needs. Chicago district rail mills are producing in the range of 50 to 55 per cent of capacity.

Prices f.o.b. mill, per gross ton: Standard section open-hearth and Bessemer, \$43; light rails, rolled from billets, \$36. Per lb.: Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 1.95c.; angle bars, 2.75c.

### Sheets

This market is dull as shown by lack of specifications and the fact that several units of hot mills will not start operating until Jan. 7. New buying is listless, but prices are holding on such business as is being transacted from day to day. The lower figures in the spreads in prices for the various products are generally available to jobbers and the larger users, and the higher quotations apply on car lots.

Base prices per lb., deliv'd from mill in Chicago: No. 24 black sheets, 2.50c. to 2.60c.; No. 24 galv., 3.05c. to 3.15c.; No. 10 blue ann'l'd, 2.05c. to 2.15c. Deliv'd prices at other Western points are equal to the freight from Gary, plus the mill prices, which are 5c. per 100 lb. lower than Chicago delivered prices.

### Wire Products

Mills in this district have resumed output at the rate which had been maintained from mid-December to the holiday shutdown. New buying remains sluggish, and specifications are not equal to production. As a result, stocks at mills continue to grow slowly, which is not an unusual condition at this time of year, when producers are hopefully looking to the spring trade. It is generally believed that stock in the hands of jobbers are low and that dealers as a rule are carrying only their immediate needs. Many signs point to a heavy spring demand for wire mesh for concrete reinforcement, which now is seasonally quiet.

Many municipalities have paving programs. Governmental road work aid is counted on to add tonnage to mill books. Demand for copper wire and cable is listless. Public utilities are slow in making contracts, and the radio industry is quiet.

#### Bars

Specifications for mild steel bars are tending to expand, following a dearth of releases during the holiday period. Particularly encouraging in this respect is the greater use of bar mill products by automobile manufacturers and parts makers. Several forgers in this district have stepped up output from one to three days a week, and reports are heard that further improvement is in sight before the end of the month. Road machinery builders continue at an active pace, but farm implement manufacturers are slow in making headway in production programs.

The iron market is listless, with railroad demand in very moderate volume. Alloy steel bar mills are slowly gaining in output, the average this week being not far from 55 per cent of capacity.

Rail steel bar makers have entered the year with light bookings and few releases at hand. One mill is still undergoing heavy repairs and may not resume operations until the end of the month, even though it be ready to operate before that time. The price of rail steel bars is 1.60c. a lb., with a few orders being taken at 1.65c.

#### Plates

The plate market is somewhat slow in gaining headway after the holiday shutdown. Several inquiries for tank plates total 2000 tons, and it is reported that several new projects are taking shape. Pipe output remains fairly steady, and the outlook for increased demand for this commodity is improving. Several important projects are now being figured and others are being considered. Railroad equipment is almost a dead issue at the moment.

#### Bolts, Nuts and Rivets

Specifications for these commodities show moderate increase in the opening days of the new year. Releases issued in the old year for delivery in January are promising, but in general users are not hurrying to fulfill these obligations. Automobile parts manufacturers and in some instances builders of farm equipment are among the larger users.

#### Structural Material

Awards during the week totaled close to 13,000 tons. Fresh inquiries are for a like amount. Railroad work is gaining prominence. The Missouri-Kansas-Texas contemplates a bridge across the Missouri River requiring 10,000 tons. This closely follows the announcement that the Wabash will use about 18,000 tons for a bridge across the same river. The date on which construction of the Chicago

subway will start is still uncertain, although it is possible that certain legal matters can be disposed of in about 60 days.

#### Reinforcing Bars

Except for some Cook County, Ill., road work, on which bids will be opened Jan. 12, there is little business now before local dealers in reinforcing bars. Architects have many plans prepared, but there seems little prospect that January will bring much in the way of bookings at warehouses. Bending operations, following holiday suspensions, have been resumed at about 20 per cent of capacity. Prices have not changed, but some dealers may publish new quotations before the end of this month.

#### Coke

Forward contracting is about 95 per cent completed. The price remains steady at \$8 a ton, local ovens. Releases for January are turning up, and there is already promise that shipments this month will be heavier than in December.

#### Old Material

Although activity has gained some headway, the local scrap iron and steel market still can be characterized as dull. The outlook for the immediate future is somewhat clouded, but some in the trade anticipate an upturn by mid-January. Trades among brokers are tightening, and prices being paid are on the upgrade. Railroad lists are bringing out keen competition, with the result that bids are working to higher price levels. The willingness of brokers to bid higher is influenced by several causes. Scrap production and flow to the market are restricted by economic conditions and the weather, therefore some grades are somewhat scarce. Some brokers are anxious to complete old commitments, and, finally, there is a desire to test the speculative side of the market. This last phase of the situation seems to be rather clearly

#### Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	2.90c.
Reinforcing bars, billet steel	1.70c.
Rail steel reinforcement	1.50c.
Cold-fin, steel bars and shafting—	
Rounds and hexagons	3.35c.
Flats and squares	3.85c.
Bands $\frac{3}{8}$ in. (in Nos. 10 and 12 gages)	3.10c.
Hoops (No. 14 gage and lighter)	3.65c.
Black sheets (No. 24)	3.80c.
Galv. sheets (No. 24)	4.35c.
Blue ann'l'd sheets (No. 10)	3.35c.
Spikes ( $\frac{3}{8}$ in. and larger)	3.45c.
Track bolts	4.30c.
Rivets, structural	4.00c.
Rivets, boiler	4.00c.
Per Cent Off List	
Machine bolts	60 and 10
Carriage bolts	60 and 10
Coach or lag screws	60 and 10
Hot-pressed nuts, sq., tap. or blank,	60 and 10
Hot-pressed nuts, hex., tap. or blank,	60 and 10
No. 8 black ann'l'd wire, per 100 lb.	\$3.45
Com. wire nails, base per keg	2.30
Cement c't'd nails, base per keg	2.30

	Per Cent Off List
Machine bolts	60 and 10
Carriage bolts	60 and 10
Coach or lag screws	60 and 10
Hot-pressed nuts, sq., tap. or blank,	60 and 10
Hot-pressed nuts, hex., tap. or blank,	60 and 10
No. 8 black ann'l'd wire, per 100 lb.	\$3.45
Com. wire nails, base per keg	2.30
Cement c't'd nails, base per keg	2.30

shown by recent moves to accumulate malleable grades. A consumer purchased a small tonnage of heavy melting steel at \$10.50 a gross ton, delivered, which is the price that prevailed through most of the past month. Among lists being offered are 5000 tons by the Santa Fe, 30,000 tons by the Pennsylvania and a blank list by the Michigan Central.

Prices deliv'd Chicago district consumers:  
Per Gross Ton

Basic Open-Hearth Grades:	
Heavy melting steel..... \$10.00 to \$10.50	
Shoveling steel ..... 10.00 to 10.50	
Frogs, switches and guards, cut apart, and misc. rails	11.25 to 11.75
Factory hyd. comp. sheets	8.50 to 9.00
Drop forge flashings	7.75 to 8.25
No. 1 busheling	8.00 to 8.50
Ford'd cast and r'l'd steel carwheels	13.50 to 14.00
Railroad tires, charg. box size	13.50 to 14.00
Railroad leaf springs cut apart	13.50 to 14.00

Acid Open-Hearth Grades:	
Steel couplers and knuckles	12.00 to 12.50
Coll springs	13.50 to 14.00

Electric Furnace Grades:	
Axle turnings	11.00 to 11.50
Low phos. punchings	11.50 to 12.00
Low phos. plates, 12 in. and under	11.50 to 12.00
Machine shop turnings	4.25 to 4.75

Blast Furnace Grades:	
Axle turnings	9.00 to 9.50
Cast iron borings	5.50 to 6.00
Short shoveling turnings	5.00 to 5.50
Machine shop turnings	4.25 to 4.75

Rolling Mill Grades:	
Iron rails	11.00 to 11.50
Rerolling rails	12.50 to 13.00

Cupola Grades:	
Steel rails, less than 3 ft.	12.50 to 13.00
Steel rails, less than 2 ft.	13.00 to 13.50
Angle bars, steel	11.75 to 12.25
Cast iron carwheels	11.25 to 11.75

Malleable Grades:	
Railroad	12.75 to 13.25
Agricultural	11.25 to 11.50

Miscellaneous:	
*Relaying rails, 56 to 60 lb.	23.00 to 25.00
*Relaying rails, 65 lb. and heavier	26.00 to 31.00

#### Per Net Ton

Rolling Mill Grades:	
Iron angle and splice bars	10.50 to 11.00
Iron arch bars, and transoms	11.00 to 11.50
Iron car axles	20.00 to 21.00
Steel car axles	13.00 to 13.50
No. 1 railroad wrought	8.50 to 9.00
No. 2 railroad wrought	8.75 to 9.25
No. 1 busheling	6.50 to 7.00
No. 2 busheling	4.50 to 5.00
Locomotive tires, smooth	12.50 to 13.00
Pipes and flues	5.50 to 6.00

Cupola Grades:	
No. 1 machinery cast	9.50 to 10.00
No. 1 railroad cast	9.00 to 9.50
No. 1 agricultural cast	8.50 to 9.00
Stove plate	7.75 to 8.25
Grate bars	7.50 to 8.00
Brake shoes	7.75 to 8.25

\*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

#### Coal Stocks Sufficient for 31 Days' Consumption

Stocks of bituminous coal in the United States, as of Dec. 1, are reported by the National Association of Purchasing Agents as equivalent to about 31 days' supply at current rates of consumption. By-product coke plants have enough for 38 days; electric utilities, for 53 days; coal gas plants, for 62 days; railroads, for 22 days; steel mills, for 24 days, and other industries for 27 days. Total stocks, including both anthracite and bituminous, are reported at 34,162,000 net tons.

# CLEVELAND

CLEVELAND, Jan. 6.—The new year has started with an improved sentiment in the steel industry and with more tonnage on the books than for some time, although the holiday last week caused somewhat of a lull in orders.

The greatest amount of activity is in the motor car field. Automobile manufacturers have arranged their schedules for the next few weeks and, while these are not large, they will be better than in December. The automobile companies are purchasing steel for their early requirements, extending in some cases well through February. Some of the parts makers are also getting busier. Mill products benefiting by this activity include plain carbon and alloy steel bars, sheets and hot and cold-rolled strip steel. The Ford Motor Co. will resume operations Jan. 12.

While some consumers outside of the automotive field have issued new specifications for steel, many of these seem uncertain regarding the extent of their operations this month.

Steel plant operations in Cleveland declined slightly this week, two plants taking off a furnace and one adding a furnace. The local plants are now operating at 47 per cent of ingot capacity. The Republic Steel Corp. on Monday started up three open-hearth furnaces at its Central Alloy plant in Massillon, which had been shut down since early last July.

The \$1 a ton price advance to 1.65c., Pittsburgh, on plates and shapes became effective Jan. 1, and mills seem determined to hold to the advance on all new business, although considerable of the tonnage for the quarter will be shipped at 1.60c. against contracts recently taken. A similar situation exists in respect to steel bars, which some of the mills advanced to 1.70c., Cleveland, Jan. 1, after closing contracts at 1.65c.

## Pig Iron

Shipping orders showed a fair gain the past week, following the slowing down for the holidays. Schedules of some of the foundries call for larger shipment than during the early part of December. Orders for malleable iron from foundries that supply the Ford Motor Co. with malleable castings have increased considerably. Sales were light during the week, but inquiry shows a moderate gain. As foundries bought rather sparingly for the first quarter, not a great deal of iron due on last quarter's contracts was carried over to the current quarter.

Prices are fairly steady and furnaces are showing less disposition to cut silicon differentials than recently. Lake furnaces quote foundry and

## New Year Starts with Improved Sentiment and More Tonnage

malleable iron at \$16 to \$16.50 for Ohio and northern Indiana shipment, \$17.50 for Michigan and \$17.50, Cleveland, for local delivery.

*Prices per gross ton at Cleveland:*  
 N'th'n fdy., sll. 1.75 to 2.25..... \$17.50  
 S'th'n fdy., sll. 1.75 to 2.25..... 17.01  
 Malleable..... 17.50  
 Ohio silvery, 8 per cent..... 25.00  
 Stand. low phos., Valley..... 27.00

Prices are f.o.b. furnace except on Southern foundry and silvery iron. Freight rates: 50c. average local switching charge; \$3 from Jackson, Ohio; \$6.01 from Birmingham.

## Bars, Plates and Shapes

Orders were not very plentiful the past week. Many consumers sent in specifications before the holidays against expiring contracts for steel for shipment in January to take care of their early requirements. However, some new inquiry is now coming out. There is quite an improvement in orders for alloy steel bars from some of the forge shops that are getting busier with automotive work. Steel bars have been advanced \$1 a ton by most mills to 1.70c., Cleveland, both for local delivery and outside shipment, although most consumers were previously covered by first quarter contracts at 1.65c. The \$1 a ton advance in plates and shapes to 1.65c., Pittsburgh, became generally effective with the new year.

Activity in the building field is still light. The only inquiry of size is from the Otis Steel Co., which has taken bids on 1400 tons of structural material for plant extensions to provide room for a continuous sheet mill.

## Wire Products

Inquiry for nails for jobbers' stocks shows a slight improvement. While there is still pressure for concessions from \$1.90 a keg, mills appear to be holding firmly to that price.

## Sheets

Specifications from the motor car industry increased the past week and a number of mills have more tonnage on their books than for some time. The Fisher Body Corp. placed a

### Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and struc. shapes.....	2.95c.
Soft steel bars.....	2.85c.
Reinforc. steel bars.....	2.25c. to 2.50c.
Cold-fin. rounds and hex.....	3.40c.
Cold-fin. flats and sq.....	3.90c.
Hoops and bands, No. 12 to $\frac{1}{2}$ in., inclusive.....	3.10c.
Hoops and bands, No. 13 and lighter.....	3.65c.
Cold-finished strip.....	5.95c.
Black sheets (No. 24).....	3.60c.
Galvanized sheets (No. 24).....	4.35c.
Blue ann'd sheets (No. 10).....	3.10c.
No. 9 ann'd wire, per 100 lb.....	\$2.35
No. 9 galv. wire, per 100 lb.....	2.80
Com. wire nails, base per keg.....	2.25

\*Net base, including boxing and cutting to length.

round tonnage chiefly in auto body sheets for its Cleveland plant for delivery until late in February for manufacturing Chevrolet bodies. This was divided among several mills. This Fisher body unit has returned to its policy of buying for five weeks' requirements. Its new orders, while not as large as those placed in December, are understood to aggregate about 10,000 tons. A moderate amount of other sheet business, mostly in small lots, came out during the week, much of it from consumers who are replenishing their stocks, which were very low at inventory time. Manufacturers of partitions and other building material continue to issue specifications and appear to be busier than other industries outside the automotive field. The market is firm at regular quotations and attempts to secure lower prices seem to have about disappeared.

## Strip Steel

Good orders for both hot and cold-rolled strip came from the motor car industry the past week. Other consuming industries show little life. The price spread on hot-rolled strip has virtually disappeared. It is commonly quoted at 1.55c., Pittsburgh, for wide and 1.65c. for narrow. The market is firm at these prices. For less than car lots, \$2 a ton higher is quoted. Cold-rolled strip is firm at 2.25c., Cleveland, for car lots.

## Old Material

While dealers have been looking for some buying by mills after the start of the new year, this has not yet materialized. Mills still have large stocks of scrap and have not lifted restrictions against shipments. Prices on compressed sheet steel and No. 1 busheling have declined 50c. a ton. Other grades are unchanged, but untested.

*Prices per gross ton delivered consumers' yards:*

**Basic Open-Hearth Grades:**  
 No. 1 heavy melting steel..... \$10.25 to \$10.75  
 No. 2 heavy melting steel..... 9.75 to 10.25  
 Compressed sheet steel..... 9.25 to 9.50

**Light buckled sheet stampings.....** 8.50 to 9.00  
 Drop forge flashings..... 9.75 to 10.00  
 Machine shop turnings..... 4.75 to 5.25  
 Short shoveling turnings..... 7.75 to 8.00  
 No. 1 railroad wrought..... 9.50 to 10.00  
 No. 2 railroad wrought..... 10.00 to 10.50  
 No. 1 busheling..... 9.00 to 9.50  
 Pipes and flues..... 6.50 to 7.00  
 Steel axle turnings..... 9.50 to 10.00

**Acid Open-Hearth Grades:**  
 Low phos., billet bloom and slab crops..... 16.50 to 17.00

**Blast Furnace Grades:**  
 Cast iron borings..... 7.00 to 7.25  
 Mixed borings and short turnings..... 7.00 to 7.25  
 No. 2 busheling..... 6.50 to 6.75

**Cupola Grades:**  
 No. 1 cast..... 12.00 to 12.50  
 Railroad grate bars..... 10.00 to 10.50  
 Stove plate..... 10.50 to 11.00  
 Rails under 3 ft..... 16.00 to 16.50

**Miscellaneous:**  
 Rails for rolling..... 16.25 to 16.50  
 Railroad malleable..... 12.50 to 13.00

# NEW YORK

## Slow Pick-up in Steel Sales —Light Buying of Pig Iron

NEW YORK, Jan. 6.—Pig iron sales, at 4000 tons, compare with 5000 tons in the previous week and 6000 tons two weeks ago. Many foundries are still shut down for inventory and there will not be a general resumption of melt for another week or so. Shipments remain light, and inquiries are few. The Thatcher Co., Newark, has bought 1000 tons against its inquiry for 3000 tons. Competition for this business was keenest on the part of Alabama, New England and eastern Pennsylvania furnaces, but it is understood that the tonnage was placed with a Northern, rather than an Alabama, producer. Prices quoted dipped below \$17, delivered. A new competitive threat has appeared in the form of French and Belgian iron, which is being offered at \$15.13 a ton, duty paid, port of entry, following the collapse of cartel control of Continental prices. This iron is high in phosphorus and consequently may not find a ready sale in this territory.

The Worthington Pump & Machinery Corp. has closed for about 200 tons out of 400 tons wanted for Harrison, N. J., and for about 400 tons for Buffalo. It has also issued an inquiry for 200 tons of various grades for Elmwood Place, Ohio. The American Locomotive Co. is in the market for 450 tons of foundry iron for Schenectady, N. Y.

Sales of Alabama iron along the Eastern seaboard in 1930, largely for rail-and-water shipment, are estimated at 200,000 to 250,000 tons.

*Prices per gross ton, delivered New York district:*

Buffalo No. 2 fdy., sil. 1.75 to 2.25	\$20.41 to \$20.91
*Buff. No. 2, del'd. east, N. J.	18.28 to 19.28
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	17.39 to 18.39
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	17.89 to 18.89

*Freight rates: \$4.91 from Buffalo, \$1.39 to \$2.52 from eastern Pennsylvania.*

*\*Prices delivered to New Jersey cities having rate of \$3.28 a ton from Buffalo.*

### Finished Steel

A slight pick-up in orders for finished steel products has developed during the few business days of January, but the demand is not sufficient to be characterized as a buying movement. To what extent it may be a natural rebound from the reduction of inventories last month remains to be seen. However, local steel sellers are fairly hopeful and see a continued rising demand during the remainder of the month. This expectation is based on a larger number of inquiries, one of which is for 2200 tons of steel pipe. Mill operations in the East are up slightly, largely because of orders placed late in December. A local sales

office booked 30 per cent more tonnage last month than in November.

One of the most favorable signs is the firmness of prices. It has been a long time since steel companies have been so determined not to grant price concessions. On plates, shapes and bars, 1.65c., Pittsburgh, or 1.75c., Eastern mills, is the asking price for new business, but contract coverage at 1.60c., Pittsburgh, has been so widespread that there has been no real test of the 1.65c. price and there may be none for some weeks. Sheet and strip prices are firm at the lower levels of the price ranges which have been recently published, and the higher figures have virtually disappeared except on the very smallest lots. The current quotations are 2.35c., Pittsburgh, for black; 2.90c. for galvanized, 2.05c. for No. 13 gage blue annealed and 1.90c. for No. 10 blue annealed plates; 1.75c. for continuous mill sheets; 1.55c. for wide hot-rolled strip, 1.65c. for the narrow, and 2.25c. for cold-rolled strip. Makers of cold-finished steel bars have announced a new price of 2.10c., Pittsburgh and other basing points, but many users have contracts at 2c.

### Cast Iron Pipe

Inquiry from public utilities continues moderately active. Prices are unchanged at \$35 to \$36 a ton, f.o.b. Northern foundry, with concessions for winter delivery. The Charles Tenney Co., Boston, is taking bids on about 2500 tons of gas pipe for utili-

### Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars, small shapes	3.10c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	7.90c. to 7.25c.
Cold-fin. shafting and screw stock	

Rounds and hexagons	3.40c.
Flats and squares	3.90c.
Cold-roll. strip, soft and quarter hard	4.95c.
Hoops	3.75c.
Bands	3.40c.
Blue ann'd sheets (No. 10)	3.25c. to 3.40c.
Black sheets (No. 24*)	3.65c. to 3.75c.
Galvanized sheets (No. 24*)	4.25c.
Long tonne sheets (No. 24)	3.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galv. annealed	5.15c.
Tire steel, $\frac{1}{2}$ x $\frac{1}{2}$ in. and larger	3.40c.

Smooth finish, 1 to $2\frac{1}{2}$ x $\frac{1}{4}$ in. and larger	3.75c.
Open-hearth spring steel, bases	4.50c. to 7.00c.

\*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

Machine bolts, cut thread: Off List

$\frac{3}{4}$  x 6 in. and smaller... 65 to 65 and 10  
 $\frac{1}{2}$  x 30 in. and smaller... 65 to 65 and 10

Carriage bolts, cut thread:

$\frac{3}{4}$  x 6 in. and smaller... 65 to 65 and 10  
 $\frac{3}{4}$  x 20 in. and smaller... 65 to 65 and 10

Boiler Tubes: Per 100 Ft.

Lap welded, 2-in. \$19.00

Seamless steel, 2-in. 20.25

Charcoal iron, 2-in. 26.25

Charcoal iron, 4-in. 67.00

ties in New England. Export inquiry is substantial and includes about 1800 tons for Manila, P. I., and about 10,000 tons for other overseas markets, of which 7000 tons is for the Dutch East Indies.

*Prices per net ton deliv'd New York:*  
Water pipe, 6-in. and larger, \$37.90 to \$38.90; 4-in. and 5-in., \$40.90 to \$41.90; 3-in., \$47.90 to \$48.90. Class A and gas pipe, \$3 extra.

### Warehouse Business

Buying from stock has not improved since the dullness of the holiday period. Black, galvanized and blue annealed sheet prices are still subject to concessions of \$1 to \$2 a ton, and in consequence a slight revision of the price schedule is being considered.

### Coke

Specifications for foundry coke show no signs of a pick-up. Furnace coke prices are unchanged at \$2.50 to \$2.60 a net ton, Connellsburg, and foundry coke quotations follow:

Special brands of beehive foundry coke, \$4.70 to \$4.85 a net ton, ovens, or \$8.41 to \$8.56, delivered to northern New Jersey, Jersey City and Newark, and \$9.29 to \$9.44 to New York and Brooklyn; by-product foundry coke, \$9 to \$9.40, Newark or Jersey City; \$10.06, New York or Brooklyn.

### Old Material

Following purchase of about 5000 tons of No. 1 heavy melting steel at \$11, delivered, by a Coatesville, Pa., consumer, brokers are offering \$10.50 a ton, delivered. A Bethlehem, Pa., mill has closed with a dealer on 3000 tons of No. 1 steel at \$10 a ton, delivered from a New Jersey yard with a freight rate to Bethlehem of \$1.89 a ton. Other grades of scrap are inactive, but more firmness in price is evident on heavy breakable cast, which is being bought at \$10.50 a ton, delivered, Florence, N. J., and \$11 a ton, delivered, eastern Pennsylvania.

*Dealers' buying prices per gross ton, f.o.b. New York:*

No. 1 heavy melting steel \$7.00

Heavy melting steel (yard) \$5.25 to 5.50

No. 1 hvy. breakable cast 7.25 to 7.75

Stove plate (steel works) 5.00

Locomotive grate bars 5.00

Machine shop turnings 3.50

Short shoveling turnings 3.50

Cast borings (blast fur. or steel works) 3.50

Mixed borings and turnings 3.00

Steel car axles 14.00

Iron car axles 17.50 to 18.50

Iron and steel pipe (1 in. dia., not under 2 ft. long) 7.25

Forge fire 7.00

No. 1 railroad wrought 8.75

No. 1 yard wrought, long 7.75

Rails for rolling 5.50 to 5.75

Stove plate (foundry) 5.50 to 5.75

Malleable cast (railroad) 9.50 to 10.00

Cast borings (chemical) 8.50 to 9.00

*Prices per gross ton, deliv'd local foun-*

*dries:*

No. 1 machry. cast \$12.50

No. 1 hvy. cast (columns, bldg. ma-

terials, etc.); cupola size 10.50

No. 2 cast (radiators, cast boilers, etc.) 10.00

# PHILADELPHIA

## Steel Inquiry and Mill Operations Slightly Better

PHILADELPHIA, Jan. 6.—Steel operations in eastern Pennsylvania, following the holiday lull, are at about 40 per cent of capacity in both finishing and open-hearth departments. The average for ingot output is brought up by two companies which are producing at about 50 per cent, while others are running their open-hearth departments at about 33 to 40 per cent. Steel inquiry has begun to show a slight improvement, with certain consumers planning to increase their activity. Of the three leading radio manufacturers, one is still maintaining a fair rate of operation and the largest maker has already begun to buy small lots of sheets in preparation for its 1931 production program scheduled to begin early in February. Local shipyards have been buying small lots of material.

### Pig Iron

Foundry iron buying is still limited, but, with consumers' stocks reduced to a minimum, orders for carload lots are usually for immediate delivery. The price situation is unchanged, eastern Pennsylvania makers quoting \$17.50 a ton on ordinary business, but still willing to go to \$17 when a desirable tonnage is offered. Southern foundry iron is available at \$10.50 to \$11 a ton, furnace. While imports of Indian iron have been substantial in the past six weeks, totaling close to 20,000 tons, smaller arrivals are expected in the first quarter because of the prevailing prices on eastern Pennsylvania iron. Demand for low phosphorus iron is still small, individual inquiries being for unimportant tonnages which do not justify importers placing a tonnage order for the foreign product. No basic iron has been bought by eastern Pennsylvania consumers for some months, but two users are expected to place business in this month. Inquiry for foundry iron includes two carloads of malleable for the Newport News Shipbuilding & Dry Dock Co., Newport News, Va.

### Prices per gross ton at Philadelphia:

East. Pa. No. 2, 1.75 to 2.25 sil.	\$17.76 to \$18.76
East. Pa. No. 2X, 2.25 to 2.75 sil.	18.26 to 19.26
East. Pa. No. 1X	18.76 to 19.76
Basic (del'd east. Pa.)	17.75 to 18.25
Malleable	19.00 to 20.00
Stand. low phos. (f.o.b. east. Pa. furnace)	23.00 to 24.00
Cop. b'rg low phos. (f.o.b. furnace)	22.00 to 23.00
Va. No. 2 plain, 1.75 to 2.25 sil.	22.29
Va. No. 2X, 2.25 to 2.75 sil.	22.79

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 76c. to \$1.64 from eastern Pennsylvania furnaces; \$4.54 from Virginia furnaces.

### Steel Bars

Buying is small. The price continues at 1.60c., Pittsburgh, or 1.89c.,

delivered Philadelphia. Sellers are endeavoring to establish 1.65c., Pittsburgh, as a minimum price for business in the present quarter. Inquiry for reinforcing bars is increasingly active and some substantial tonnages are pending, including about 1000 tons in five barracks at Hampton Roads, Va., for the United States Marine Corps and 200 tons in a sewage disposal plant at Norristown, Pa. Prices are unchanged at 1.65c. to 1.75c., Pittsburgh, or 1.94c. to 2.04c., Philadelphia, for billet steel bars. Rail steel bars continue at about 1.50c., Franklin, Pa., or 1.79c., delivered Philadelphia.

### Shapes

Mills are maintaining 1.70c., f.o.b. nearest mill to consumer, or 1.76c., Philadelphia, except when a sizable tonnage is offered. The larger users have in many cases been protected for the quarter at 1.60c. to 1.65c., mill, or 1.66c. to 1.71c., Philadelphia. Fabricated structural steel projects are small. A bascule bridge at Stone Harbor, N. J., will require about 125 tons, and the roof of the reinforced concrete building for the Army Medical School in Washington will take about 100 tons.

### Plates

Consumers have contracted for a part of their requirements for the current quarter at 1.70c., Coatesville, Pa., or 1.80½c., delivered Philadelphia. Mills are asking 1.75c., Coatesville, Pa., or 1.85½c., Philadelphia, on new business.

### Sheets

Local sheet consumers have been more active, and some small orders have been closed since the holidays. Prices are fairly well maintained except for occasional slight concessions on large orders. Black sheets are quoted at 2.35c., Pittsburgh, or 2.64c., Philadelphia, and galvanized are 2.90c. to 3c., Pittsburgh, or 3.19c. to 3.20c., Philadelphia. Blue annealed

### Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, 1/4-in. and heavier	2.50c.
Structural shapes	2.50c.
Soft steel bars, small shapes, iron bars (except bands)	2.60c.
Reinforce. steel bars, sq., twisted and deform.	2.60c. to 2.60c.
Cold-fin. steel, rounds and hex.	3.40c.
Cold-fin. steel, sq and flats	3.90c.
Steel hoops	3.15c.
Steel bands, No. 12 to 1/2-in. inclu.	5.00c.
Spring steel	5.00c.
Black sheets (No. 24)	4.15c.
Galvanized sheets (No. 24)	3.05c.
Light plates, blue annealed (No. 10)	3.20c.
Blue ann'd sheets (No. 13)	3.20c.
Diam. pat. floor plates, 1/4-in.	5.20c.
Swedish iron bars	6.60c.

\*For 50 bundles or more; 10 to 40 bun., 4.10c. base; 1 to 9 bun., 4.35c. base.

†For 50 bundles or more; 10 to 49 bun., 4.95c. base; 1 to 9 bun., 5.30c. base.

sheets are quoted at 2.05c., Pittsburgh, or 2.34c., Philadelphia, for No. 13 gage, but this price is occasionally shaded when competition is encountered from the product of the continuous mill. Blue annealed plates range from 1.75c., Pittsburgh, or 2.04c., Philadelphia, for the continuous product to 1.90c., Pittsburgh, or 2.19c., Philadelphia, for jobbing mill plates.

### Imports

In the week ended Jan. 3, 2720 tons of chrome ore arrived at this port, of which 2000 tons was from Portuguese Africa and 720 tons from Greece. Pig iron imports consisted of 2196 tons from British India.

### Old Material

An eastern Pennsylvania consumer of No. 1 heavy melting steel has closed for about 3000 tons with a dealer at \$10 a ton, delivered, and another is understood to have bought a substantial tonnage at \$11 a ton, delivered, which would make the average price on No. 1 steel in eastern Pennsylvania \$10.50 a ton, delivered. Other grades of scrap are inactive and prices are unchanged.

### Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	\$10.00 to \$11.00
No. 2 heavy melting steel	9.00 to 9.50
Heavy melting steel (tyard)	8.50 to 9.00
No. 1 railroad wrought	12.00 to 14.00
Bundled sheets (for steel works)	9.00
Hydraulic compressed, new	10.00 to 10.50
Hydraulic compressed, old	9.00 to 9.50
Machine shop turnings (for steel works)	6.50 to 7.50
Heavy axle turnings (or equiv.)	10.50 to 11.00
Cast borings (for steel works and roll. mill)	7.50
Heavy breakable cast (for steel works)	11.00 to 11.50
Railroad grate bars	9.00
Stove plate (for steel works)	9.00
No. 1 low phos. hvy., 0.04% and under	17.00 to 18.00
Couplers and knuckles	16.50 to 17.50
Rolled steel wheels	15.50 to 16.00
No. 1 blast furnace scrap	6.50 to 7.00
Wrot iron and soft steel pipes and tubes (new specific)	11.50 to 12.00
Shafting	18.00
Steel axles	20.50 to 21.00
No. 1 forge fire	11.00
Cast iron carwheels	14.00 to 14.50
No. 1 cast	12.00 to 12.50
Cast borings (for chem. plant)	14.00 to 14.50
Steel rails for rolling	13.50 to 14.00

Orders for sanitary enameled flat ware last November were valued at \$853,919, against \$754,533 in October, and shipments were valued at \$890,285 and \$880,196, respectively. Orders in the first 10 months of 1930 were valued at \$8,116,499, compared with \$9,882,076 in the corresponding period of 1929, while shipments were valued at \$8,594,315 and \$10,025,231, respectively.

## BIRMINGHAM Steel Operations Aided by Rail Orders —Cast Iron Pipe Active

**B**IRMINGHAM, Jan. 6.—Sales of pig iron began climbing upward again last week after holiday let-up, but the increase was slow. Demand came largely from consumers who are continuing their policy of conservatively limiting purchases to requirements for orders actually booked or in sight. Consumers in the Southern territory have shown only slight interest in covering for all or for any important part of the first quarter. There has been some demand for first quarter iron from other sections. The market entered the year without any formal announcement as to first quarter prices and the small first quarter sales for district delivery have been made at \$14, the same price as in the last quarter.

A number of the foundries that have been idle since the middle of December are expected to resume operations this week, while some will not reopen until next week. Many of these carried forward old orders for iron. During the past two weeks furnaces have piled additional iron to already burdensome stocks.

The total of active blast furnaces continues at eight, all being on foundry except one, which is making basic. The Tennessee company is expected to put into operation by next week one, and maybe two, of its furnaces now banked at Ensley.

**PIG IRON**  
*Prices per gross ton, f.o.b. Birmingham dist. furnaces:*  
No. 2 fdy., 1.75 to 2.25 sil. .... \$14.00  
No. 1 fdy., 2.25 to 2.75 sil. .... 14.50  
Basic ..... 14.00

### Finished Steel

New business in bars, plates, sheets and shapes showed up fairly well last week, but was a little under the December average. This week's sales promise to exceed those of last week. Mills were back on pre-holiday schedules last week, having been closed the last three days of Christmas week in most instances. The Tennessee company has announced that the Ensley rail mill will reopen on Jan. 12 following booking of 50,750 tons of rails for the Louisville & Nashville. In addition, this railroad placed orders for approximately 10,000 tons of spikes and other accessories which will strengthen rolling schedules at the Fairfield works. Other smaller rail orders that have accumulated during the past several weeks give the Ensley rail mill a fair amount of forward orders.

Structural steel fabricators report the market looking up as compared with the December conditions. New orders of the Ingalls Iron Works Co. include 250 tons for an office building in Atlanta, 200 tons for the Birmingham Slag Co. plant at Ensley and 150 tons for a bridge at Inverness, Fla. The Nashville Bridge Co. will furnish 400 tons for power line towers at Waco, Tex.

The Gulf States Steel Co. has taken off one open-hearth at Alabama City and is now working three of six. At Fairfield, the Tennessee company is operating six of eight, an increase of one and the highest number in several weeks. The Tennessee company is preparing to place in operation five of its nine open-hearts at Ensley prior to resuming operations at the rail mill on Jan. 12.

### Cast Iron Pipe

Makers are beginning the year with backlog equally as large as those of one year ago and the outlook for the next several weeks is reported better than it was at the beginning of last year. New inquiries are reported from utilities, and additional municipalities have made known their requirements since the beginning of the year. Plants here have bids in on about 2000 tons of pipe scheduled to be awarded by Minneapolis. Bogalusa, La., opens bids Jan. 6 on 4300 ft. of 12 and 16-in. pipe. Local plants bid on 1200 tons of 6 to 20-in. pipe at Oakland, Cal. Other smaller projects are pending on the Pacific Coast. Fountain City, Tenn., is planning work to require 71,000 ft. of 6-in. pipe and 8000 ft. of 8-in. pipe. Memphis is reported planning to purchase additional pipe soon.

Several shops resumed operations

last week and others are to take up production again this week at a rate fully equal to that of early December. Makers continue to offer concessions on orders for immediate delivery, but on forward buying the figures hold at \$37 to \$38, Birmingham, for 6-in. and larger sizes.

### Coke

The Tennessee company has taken off 22 more by-product ovens and is now operating 208 of 497. This reduces total active ovens in district to 881 out of 1390. This is the first time in several years that active ovens have totaled less than 900. Demand is light. The price remains at \$5 a net ton, Birmingham.

### Old Material

Buying has been resumed on a small scale, steel grades coming in for most of the orders. Some heavy melting steel was sold last week at \$11, which is \$1 more than the December price. Other prices are unchanged.

*Prices per gross ton deliv'd Birmingham dist. consumers' yards:*  
Heavy melting steel.... \$10.50 to \$11.00  
Scrap steel rails..... 10.50  
Short shoveling turnings..... 9.00  
Cast iron borings..... 9.00  
Stove plate..... 9.00  
Steel axles..... 19.00  
Iron axles..... 18.00  
No. 1 railroad wrought..... 10.00  
Rails for rolling..... 11.50 to 12.00  
No. 1 cast..... 11.00 to 11.25  
Tramcar wheels..... 11.00 to 11.25  
Cast iron borings, chem..... 13.50  
Cast iron carwheels..... 11.00

## CINCINNATI

### Sheet Steel Demand Improves After Holiday Lull

### Finished Steel

An uptrend in demand for sheets has followed the holiday lull. During the holiday period bookings declined almost to 30 per cent of capacity, but during the last week the rebound brought orders above the 50 per cent level. Accordingly, operations are

### Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and struc. shapes.....	3.25c.
Bars, soft steel or iron.....	3.15c.
New billet reinforce. bars.....	3.15c.
Rail steel reinforce. bars.....	3.00c.
Hoops.....	3.90c.
Bands.....	3.35c.
Cold-fin. rounds and hex. squares.....	3.80c.
Black sheets (No. 24).....	4.05c.
Galvanized sheets (No. 24).....	4.90c.
Blue ann'd sheets (No. 10).....	3.45c.
Structural rivets.....	4.20c.
Small rivets.....	60 per cent off list
No. 9 ann'd wire, per 100 lb. ....	\$3.00
Com. wire nails, base per keg (25 kegs or more).....	2.95
Cement c't'd nails, base 100 lb. keg.....	2.95
Chain, per 100 lb. ....	10.25
Net per 100 Ft.	
Lap-welded steel boiler tubes, 2-in. ....	\$16.50
4-in. ....	34.50
Seamless steel boiler tubes, 2-in. ....	17.50
4-in. ....	36.00

Freight rates, \$1.89 from Ironton and Jackson, Ohio; \$3.69 from Birmingham.

well above the half-way mark. The most noticeable increase in demand is coming from the automotive field.

### Coke

There is no new business in the foundry grades of coke, but specifications against contracts have improved slightly. The price on by-product foundry coke continues at \$9, delivered in Cincinnati.

### Old Material

Once the inventory period is passed, it is believed that consumers will enter the market for scrap requirements. Prices are steady.

*Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:*

Heavy melting steel	\$10.00 to \$10.50
Scrap rails for melting	10.50 to 11.00
Loose sheet clippings	5.50 to 6.00
Bundled sheets	8.75 to 9.25
Cast iron borings	4.00 to 4.50
Machine shop turnings	5.00 to 5.50
No. 1 busheling	8.00 to 8.50
No. 2 busheling	4.50 to 5.00
Rails for rolling	11.50 to 12.00
No. 1 locomotive tires	11.00 to 11.50
No. 2 railroad wrought	9.50 to 10.00
Short rails	14.75 to 15.25
Cast iron carwheels	10.50 to 11.00
No. 1 machinery cast	14.00 to 14.50
No. 1 railroad cast	12.00 to 12.50
Burnt cast	6.50 to 7.00
Stove plate	6.50 to 7.00
Brake shoes	6.50 to 7.00
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50

## CANADA

### Structural Steel Outlook Hopeful—Pig Iron and Scrap Quiet

TORONTO, Jan. 6.—The pig iron market is still suffering from the holiday season, and, while some future booking has been done, sales have been limited during the past two or three weeks. Melters in eastern Canada have very little iron in stock.

*Prices per gross ton:*

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	\$22.60
No. 2 fdy., sil. 1.75 to 2.25	22.10
Malleable	22.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	\$24.00
No. 2 fdy., sil. 1.75 to 2.25	23.50
Malleable	24.00
Basic	20.50

### Structural Steel

Indications regarding new building programs point to a more active quarter in structural steel sales. In addition to large contracts pending for bridge construction, announcements have been made in various parts of Canada regarding the erection of new buildings for which sizable tonnages of steel will be required. During the past few months the use of reinforcing bars has cut largely into structural steel sales, but Canadian fabricators are still of the opinion that there will be a big market for their products in

1931. Sales for the week were mostly in lots under 1000 tons, although contracts pending range up to 3000 tons.

### Old Material

Canadian scrap dealers do not look for much improvement during the next two or three months. Steel scrap is moving sluggishly. Iron grades, however, are expected to show renewed activity and some business in these materials has already developed. Dealers have made no change in prices.

*Dealers' buying prices for old material:*

Per Gross Ton	Toronto	Montreal
Heavy melting steel	\$7.00	\$6.00
Rails, scrap	7.00	6.00
No. 1 wrought	6.00	8.00
Machine shop turnings	2.00	2.00
Boiler plate	5.00	4.50
Heavy axle turnings	2.50	2.50
Cast borings	2.00	2.00
Steel borings	2.00	2.00
Wrought pipe	2.00	2.00
Steel axles	7.00	9.00
Axes, wrought iron	7.00	11.00
No. 1 machinery cast	10.00	10.00
Stove plate	8.00	8.00
Standard carwheels	8.50	8.00
Malleable	8.00	8.00
Per Net Ton		
No. 1 mach'ry cast	11.00	—
Stove plate	9.00	—
Standard carwheels	10.00	—
Malleable	9.00	—

## Youngstown

### Automobile Business Aids Valley Mills

YOUNGSTOWN, Jan. 6.—A number of bright spots mark the iron and steel situation in the Mahoning and Shenango Valleys, including a slight increase in the schedules of the Republic Steel Corp. and the Newton Steel Co. All companies supplying steel to the automobile industry are benefiting by expanding automobile production.

The Republic company plans to start its blast furnace at Warren, and this week increases activities in its lapweld and buttweld pipe mills at Youngstown, adding 150 men to its forces.

Offsetting these gains, however, are a number of recessions. Sharon Steel Hoop is active on a somewhat lower scale in its sheet and strip departments, while the Falcon plant at Niles of the Empire Steel Corp., Mansfield, which operated last week, is again inactive. Republic is operating 24 tin mills at its Warren plant, but its sheet mills are idle. The Youngstown Sheet & Tube Co. continues to operate at 35 per cent, while the Carnegie Steel Co. is at 50 per cent.

John A. Roebling's Sons Co., Trenton, N. J., has begun the publication of a house organ which has been named "Wire Engineering." The editorial material will cover engineering and news data on wire rope and welding wire, flat wire, copper and insulated wire and cables, etc.

## BOSTON

### Brighter Outlook in Structural and Reinforcing Steel—Pig Iron Dull

1500 tons was sold the past week for delivery outside New England.

*Foundry iron prices per gross ton deliv'd to most New England points:*

*Buffalo, sil. 1.75 to 2.25	\$19.91 to \$20.91
*Buffalo, sil. 2.25 to 2.75	19.91 to 20.91
*Ala., sil. 1.75 to 2.25	21.11
*Ala., sil. 2.25 to 2.75	21.61
*Ala., sil. 1.75 to 2.25	17.25
†Ala., sil. 2.25 to 2.75	17.75

Freight rates: \$4.91 all rail from Buffalo; \$9.61 all rail from Alabama and \$5.75 rail and water from Alabama to New England seaboard.

\*All rail rate.

†Rail and water rate.

### Fabricated Steel

Fabricators have upward of 20,000 tons of steel to figure, the largest amount in some time. The outstanding job is the Boston Post Office, involving about 10,000 tons. Lettings the past week were about 500 tons. Competition for business among fabricators continues very keen, and some low prices are being made even on small tonnages.

### Cast Iron Pipe

The United States Pipe & Foundry Co. took most of the 3700 tons of pipe awarded the past week, including 1830 tons of 4 to 20-in. for Providence, R. I.; 1400 tons of 4 to 20-in. for Pawtucket, R. I., and 350 tons of 6 to 12-in. for New Bedford, Mass.,

### Warehouse Prices, f.o.b. Boston

Base per Lb.	
Plates	3.36 1/2c.
Structural shapes—	
Angles and beams	3.36 1/2c.
Tees	3.36 1/2c.
Zees	3.36 1/2c.
Soft steel bars, small shapes	3.26 1/2c.
Reinforcing bars	3.11 1/2c. to 3.26 1/2c.
Iron bars—	
Refined	3.26 1/2c.
Best refined	4.60c.
Norway rounds	6.60c.
Norway squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tire steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold-rolled steel—	
Rounds and hex.	3.50c. to 5.50c.
Squares and flats	4.00c. to 6.00c.
Toe calk steel	6.00c.
Rivets, structural or boiler	4.80c.
Per Cent Off List	
Machine bolts	60 and 5
Carriage bolts	60 and 5
Lag screws	60 and 5
Hot-pressed nuts	60 and 5
Cold-punched nuts	60 and 5
Stove bolts	70 and 10

a total of 3580 tons. The other 120 tons was in car lots. The market for 6-in. and larger pipe remains at or about \$36 a ton, foundry. Marlboro, Plymouth, North Attleboro, Templeton, Natick and Lowell, Mass., contemplate entering the market for pipe during the first quarter.

### Reinforcing Steel

More than 4000 tons has come into the market for figuring, including 1500 tons for the Boston Post Office, 1000 tons for a telephone company unit and 1000 tons for two State roads. Murch Brothers Construction Co., St. Louis, has been awarded a contract for a \$1,818,000 New London, Conn., Coast Guard unit and will soon buy 500 tons of bars. The market for billet steel bars is: 1 to 5-ton lots, 3c. a lb., base, from stock; 6 to 99-ton lots, 2.40c.; 100-ton lots and larger, 2.15c. Rail steel bars are 2.26½c. a lb., delivered common Boston freight rate points.

### Old Material

The market is deadlocked. Prices offered for old material by consumers are too low to be attractive to shippers and owners of scrap, consequently billings the past week were inconsequential. The trade here takes it for granted the market will remain dull during the first half of January, at least.

#### Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	\$6.60 to	\$7.10
Scrap T rails	6.60 to	7.10
Scrap girder rails	5.60 to	6.10
No. 1 railroad wrought	7.00 to	7.50
Machine shop turnings	2.00 to	2.60
Cast iron borings (steel works and rolling mill)	2.00 to	2.60
Bundled skeleton, long	5.75 to	6.10
Forge flashings	5.75 to	6.10
Blast furnace borings and turnings	2.00 to	2.10
Forge scrap	5.60 to	6.10
Shafting	12.50 to	13.50
Steel car axles	14.00 to	15.00
Wrought pipe, 1 in. in diameter (over 2 ft. long)	6.00 to	6.50
Rails for rolling	8.50 to	9.00
Cast iron borings, chemical	9.00 to	9.50
No. 2 cast	5.50 to	6.00

#### Prices per gross ton deliv'd consumers' yards:

Textile cast	\$10.50 to	\$11.00
No. 1 machinery cast	11.50 to	12.50
Stove plate	7.00 to	7.25
Railroad malleable	13.00 to	13.50

### Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-fin. rounds, shafting, screw stock	3.60c.
Black sheets (No. 24)	4.25c.
Galv. sheets (No. 24)	4.60c.
Blue anodized sheets (No. 10)	3.45c.
Black corrug. sheets (No. 24)	4.10c.
Galv. corrug. sheets	4.70c.
Structural rivets	4.15c.
Boiler rivets	4.15c.
Per Cent Off List	
Tank rivets, $\frac{1}{8}$ -in. and smaller, 100 lb. or more	65
Less than 100 lb.	60
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more	60
Less than 200 lb.	50
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more	60
Less than 200 lb.	50

## ST. LOUIS Heavier Pig Iron Shipments Assured This Month—Some Scrap Buying

ST. LOUIS, Jan. 6.—Shipping instructions against contracts continued to reach the St. Louis Gas & Coke Corp. during the last week, with the result that assurance is given that shipments during January will be at least 60 per cent ahead of those of last month, which were the largest in seven months. Melters of basic iron on the East Side came into the market during the week for the first quarter requirements, which, it is stated, are for the same tonnages as for the preceding period. A large manufacturer of agricultural implements bought a round tonnage of foundry and malleable grades for its first quarter needs, most of the business going to the St. Louis Gas & Coke Corp. The market is firm at unchanged prices.

#### Prices per gross ton at St. Louis:

No. 2 fdy., sil.	1.75 to	2.25, f.o.b.
Granite City, Ill.	.....	\$17.50
Malleable, f.o.b. Granite City	.....	17.50
N'th'n No. 2 fdy., deliv'd St. Louis	.....	19.66
Southern No. 2 fdy., deliv'd	.....	14.92
Northern malleable, deliv'd	.....	19.66
Northern basic, deliv'd	.....	19.66

Freight rates: 75c. (average) Granite City to St. Louis; \$2.16 from Chicago; \$4.42 from Birmingham.

### Finished Steel

Buyers of plates, shapes, bars and sheets marked time over the holiday period, but, with that and inventory taking out of the way, some pickup is expected from now on. Warehouse business is reported to have been about 30 per cent off from 1929 figures. The only letting of reinforcing bars for the week was 130 tons for a school building to the Missouri Rolling Mills Corp.

### Old Material

The feature of the market for old material was the purchase by the lead-

ing blast furnace interests in the district of 7000 to 8000 tons of borings and shoveling turnings for shipment during the first quarter. Dealers increased their price 25c. a ton following the order. A small tonnage of No. 2 heavy melting steel also was bought. Some weakness is shown in other items, No. 1 heavy melting steel, miscellaneous standard-section rails, No. 2 railroad wrought, and No. 1 railroad cast being 25c. less, and railroad springs, steel car axles, wrought iron bars and transoms, steel angle bars, railroad malleable and agricultural malleable are 50c. off.

Railroad lists: Baltimore & Ohio, 20,705 tons; Pennsylvania, 30,470 tons; Southern Pacific, 2855 tons; Milwaukee Road, 123 carloads; Chicago & North Western, 70 carloads.

#### Dealers' buying prices per gross ton, f.o.b. St. Louis district:

Selected heavy melting steel	.....	\$10.50 to \$11.00
No. 1 heavy melting or shoveling steel	.....	9.50 to 10.00
No. 2 heavy melting or shoveling steel	.....	9.00 to 9.50
No. 1 locomotive tires	.....	11.00 to 11.50
Misc. stand.-sec. rails including frogs, switches and guards, cut apart	.....	10.75 to 11.00
Railroad springs	.....	12.75 to 13.25
Bundled sheets	.....	6.50 to 7.00
No. 2 railroad wrought	.....	9.50 to 10.00
No. 1 busheling	.....	7.00 to 7.50
Cast iron borings and shoveling turnings	.....	6.25 to 6.75
Iron rails	.....	9.50 to 10.00
Rails for rolling	.....	11.75 to 12.25
Machine shop turnings	.....	3.50 to 4.00
Heavy turnings	.....	8.00 to 8.50
Steel car axles	.....	14.00 to 14.50
Iron car axles	.....	20.50 to 21.00
Wrot. iron bars and trans.	.....	12.00 to 12.50
No. 1 railroad wrought	.....	7.50 to 8.00
Steel rails, less than 3 ft.	.....	13.00 to 13.50
Steel angle bars	.....	9.50 to 10.00
Cast iron carwheels	.....	11.00 to 11.50
No. 1 machinery cast	.....	10.50 to 11.00
Railroad malleable	.....	10.50 to 11.00
No. 1 railroad cast	.....	9.75 to 10.25
Stove plate	.....	8.50 to 9.00
Relay. rails, 60 lb. and under	.....	16.00 to 16.50
Relay. rails, 70 lb. and over	.....	20.00 to 21.00
Agricult. malleable	.....	9.50 to 10.00

## PACIFIC COAST

### Structural Steel Awards of More Than 5000 Tons Feature Business

SAN FRANCISCO, Jan. 3.—(By Air Mail)—Movement of steel tonnage on the Pacific Coast has slowed down now that most consumers are taking inventories. The majority of new inquiries involve small lots. Featuring the awards of the week were 1750 tons for an auditorium in Pasadena, Cal., booked by the Consolidated Steel Corp., and 1600 tons of cast iron pipe for the Ross Island pipe line, Portland, placed with the United States Pipe & Foundry Co.

### Bars

Mill prices on merchant bars are unchanged at 2.25c. c.i.f. Out-of-stock quotations on reinforcing bars in the Los Angeles and San Francisco districts appear firm at 2.50c. a base, on carload lots. Bookings this week exceeded 1250 tons, and included 500

#### Pig iron prices per gross ton at San Francisco:

Utah basic	.....	\$22.00 to \$24.00
Utah fdy., sil.	2.75 to	3.25
Utah fdy., sil.	2.75 to	3.25

\*Delivered San Francisco.

\*\*Duty paid, f.o.b. cars San Francisco.

tons for an auditorium in Pasadena and 400 tons for the Isthmus Inlet bridge near Coquille, Ore., both awarded to unnamed interests. The Soule Steel Co. took 250 tons for a mausoleum at Compton, Cal. Awards for 1930 totaled 62,258 tons, compared with 66,954 tons for 1929.

### Plates

The Moore Dry Dock Co. secured 125 tons of plates and shapes for a lighthouse tender for the Government

### Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and struc. shapes	3.40c.
Soft steel bars	3.40c.
Black sheets (No. 24)	4.35c.
Blue ann'td sheets (No. 10)	3.80c.
Galv. sheets (No. 24)	5.00c.
Struc. rivets, $\frac{1}{2}$ -in. and larger	5.00c.
Com. wire nails, base per keg	\$3.35
Cement c'td nails, 100 lb. keg	3.35

at San Francisco. Bids were rejected on 243 tons for tanks for the Bureau of Reclamation and new bids will be opened on Jan. 10. The Western Pipe & Steel Co. was low bidder on 640 tons for a 51-in. welded steel pipe line for Los Angeles. Bids will be opened March 4 on 3200 tons for the Hoover Dam. Prices continue to range between 2.05c. and 2.15c., c.i.f.

### Shapes

Upward of 5000 tons of fabricated structural material was placed this week. The Willamette Iron & Steel Co. and Poole & McGonigle jointly took 1500 tons for dam gates, frames and spillway for the Ariel dam project, Northwestern Electric Co., at Lewis River, Wash. The Judson Pacific Co. booked 350 tons for a 40-ton gantry crane and runway for the Mare Island Navy Yard, and the Co-

lumbia Steel Co. secured 300 tons for 75-ft. plate girder spans for the Western Pacific Co., San Francisco. This company will also open bids on Jan. 16 on 600 tons for two bridges to be erected in California. The Pacific Coast Engineering Co. is low bidder on 365 tons for a bridge over the Russian River at Jenner, Cal. Plate and shape awards during 1930 totaled 176,400 tons, compared with 424,758 tons for the previous year. Plain shapes range from 2.15c. to 2.25c., c.i.f.

### Cast Iron Pipe

Bookings for 1930 were the largest in the history of the Pacific Coast trade and exceeded the 1929 bookings by 6000 tons. Awards in 1930 totaled 77,652 tons, while the 1929 bookings were 71,744 tons. French interests have taken 565 tons of 6 to 16-in. Class B pipe for Seattle. The United States Pipe & Foundry Co. secured 147 tons of 6 and 8-in. Class 150 for Redwood City, Cal. Bids will be opened Jan. 5 on 1217 tons for Oakland, Cal., the sizes ranging from 6 to 20 in. Bids have been opened on 143 tons of 4 to 10-in. Class B pipe for Inglewood, Cal. The American Cast Iron Pipe Co. is low bidder on 152 tons of 2 to 6-in. Class 150 pipe.

Cupola Grades:		
No. 1 machinery cast	10.25 to	11.00
Stove plate	9.50 to	10.00
Locomotive grate bars	8.25 to	9.25
Steel rails, 3 ft. and under	15.00 to	15.50
Cast iron carwheels	13.50 to	14.00

Malleable Grades:		
Industrial	11.00 to	12.00
Railroad	11.00 to	12.00
Agricultural	11.00 to	12.00

Special Grades:		
Chemical borings	10.50 to	11.00

### No Decision Yet As to Appeal in Merger Case

The Bethlehem Steel Corp. and the Youngstown Sheet & Tube Co., whose merger was prevented by the ruling of Judge David G. Jenkins of Common Pleas Court, Youngstown, in a suit brought by Cyrus S. Eaton and other stockholders of the Sheet & Tube company, have reached no decision, it is stated, as to whether the case will be appealed to a higher court.

On Jan. 2 a motion for a new hearing was filed by the attorneys for the two steel companies, but this was a formal matter, the court having permitted only a brief time for the filing of a notice of appeal. The motion was described as a "mechanical move" by Newton D. Baker, chief of defense counsel in the suit.

The action followed a five-hour conference held in New York on Wednesday, Dec. 31, which was attended by E. G. Grace, president of Bethlehem; James A. Campbell, chairman of the Sheet & Tube company; Frank Purcell, president of Sheet & Tube, and counsel for both companies. At this conference the court's decision was discussed by the attorneys.

## BUFFALO

### Steel Mill Operations Boosted—Pig Iron and Scrap Dull

**B**UFFALO, Jan. 6.—The volume of pig iron buying the past week was small. One melter in this district which was inquiring for 600 tons of foundry is said to have bought only 200 tons. Buffalo furnaces are asking \$16 on iron for Eastern shipment, but are getting very little business. One of the Bethlehem furnaces which was banked during the past week is now in blast, making two active at that plant.

Prices per gross ton, f.o.b. furnace:	
No. 2 fdy., sil. 1.75 to 2.25	\$17.50
No. 2X fdy., sil. 2.25 to 2.75	18.00
No. 1 fdy., sil. 2.75 to 3.25	19.00
Malleable, sil. up to 2.25	18.00
Basic	17.50
Lake Superior charcoal	27.28

### Finished Steel

A sizable rail order has boosted operations at the Lackawanna plant of the Bethlehem Steel Co. to 11 open-hearth furnaces. This schedule is expected to be maintained through January. The Donner plant of the

Republic Steel Corp. is operating four open-hearth and Wickwire-Spencer has increased from one to two. Construction will soon be started on the Ridge Road Bridge at Lackawanna, N. Y., and it is expected that the 2200 tons of structural steel required will be awarded shortly.

### Old Material

The market is very quiet. One mill has lifted suspensions to the extent of taking in a few cars of No. 2 heavy melting steel. The largest consumer continues to suspend shipments.

Prices per gross ton, f.o.b. Buffalo consumers' plants:	
Basic Open-Hearth Grades:	
No. 1 heavy melting steel	\$10.50 to \$11.00
No. 2 heavy melting scrap	9.00 to 9.50
Scrap rails	11.00
Hydraul. comp. sheets	9.00 to 9.50
Hand bundled sheets	8.00 to 8.50
Drop forge flashings	9.00 to 9.50
No. 1 busheling	9.00 to 9.50
Hvy. steel axle turnings	11.00 to 11.50
Machine shop turnings	5.50 to 6.00
No. 1 railroad wrought	10.00 to 10.50
Acid Open-Hearth Grades:	
Knuckles and couplers	13.00 to 13.50
Coil and leaf springs	13.00 to 13.50
Rolled steel wheels	13.00 to 13.50
Low phos. billet and bloom ends	15.00 to 15.50
Electric Furnace Grades:	
Short shov. steel turnings	8.50 to 9.00
Blast Furnace Grades:	
Short mixed borings and turnings	7.00 to 7.50
Cast iron borings	7.00 to 7.50
No. 2 busheling	6.00
Rolling Mill Grades:	
Steel car axles	15.00 to 15.50
Iron axles	16.00 to 16.50

### Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and struc. shapes	3.25c.
Soft steel bars	3.15c.
Reinforcing bars	2.95c.
Cold-fin. flats and sq. Rounds and hex.	3.65c.
Cold-rolled strip steel	3.15c.
Black sheets (No. 24)	4.20c.
Galv. sheets (No. 24)	4.60c.
Bands	3.50c.
Hoops	3.90c.
Blue ann'td sheets (No. 10)	3.50c.
Com. wire nails, base per keg	\$2.60
Black wire, base per 100 lb.	3.20

### Otis Steel to Have 72-In. Continuous Sheet Mill

The new 72-in. continuous sheet mill to be erected by the Otis Steel Co., Cleveland, will have a capacity for rolling sheets and light plate up to 63 in. wide, or wider than is being made on most of the present continuous mills. The Otis company announces that the contract for this mill, which was recently placed with the United Engineering & Foundry Co., amounts approximately to \$1,800,000. It will have a capacity of 36,000 tons a month, with an ultimate capacity of 50,000 tons. In addition to extensions to the mill buildings, two additional heating furnaces will be installed.

It will require the United Engineering & Foundry Co. several months to construct the equipment for the new mill. Completion of such a mill requires several months, because, after receipt of the order, the various parts must be designed by the United Engineering staff, after which patterns are made and parts cast and machined. The mill is then assembled in the plants of the producer, after which it is taken apart again to be shipped and reassembled at the steel company's plant.

# ▲▲ Semi-Finished Steel, Raw Materials, Bolts and Rivets ▲▲

## Mill Prices of Semi-Finished Steel

### Billets and Blooms

	Per Gross Ton
Berolling, 4-in. and under 10-in., Pittsburgh	\$30.00
Rerolling, 4-in. and under 10-in., Youngstown	30.00
Rerolling, 4-in. and under 10-in., Cleveland	30.00
Rerolling, 4-in. and under 10-in., Chicago	32.00
Forging quality, Pittsburgh	36.00

### Sheet Bars

(Open Hearth or Bessemer)

	Per Gross Ton
Pittsburgh	\$30.00
Youngstown	30.00
Cleveland	30.00

### Slabs

(8 in. x 2 in. and under 10 in. x 10 in.)

	Per Gross Ton
Pittsburgh	\$30.00
Youngstown	30.00
Cleveland	30.00

### Skelp

(F.o.b. Pittsburgh or Youngstown)

	Per Lb.
Grooved	1.60c.
Universal	1.60c.
Sheared	1.60c.

### Wire Rods

(Common soft, base)

	Per Gross Ton
Pittsburgh	\$35.00
Cleveland	35.00
Chicago	36.00

## Prices of Raw Material

### Ores

Lake Superior Ores, Delivered Lower Lake Ports

Per Gross Ton

Old range Bessemer, 51.50% iron	\$4.80
Old range non-Bessemer, 51.50% iron	4.65
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

Per Unit

Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria	8c. to 9c.
Iron ore, low phos., Swedish, average 68% iron	11c.
Iron ore, basic Swedish, average 65% iron	9c.
Manganese ore, washed 52% manganese, from the Caucasus	26c. to 28c.
Manganese ore, Brazilian, African or Indian, basic 50%	26c. to 28c.
Tungstenore, high grade, per unit, in 60% concentrates	\$12.50 to \$13.00

Per Gross Ton

Chrome ore, 45 to 50% Cr <sub>2</sub> O <sub>3</sub> crude, c.i.f. Atlantic seaboard	\$22.00 to \$24.00
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Per Lb.

Molybdenum ore, 85% concentrates of MoS <sub>2</sub> delivered	50c. to 55c.
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### Coke

Per Net Ton

Furnace, f.o.b. Connellsville prompt	\$2.50
Foundry, f.o.b. Connellsville prompt	\$3.25 to 4.75
Foundry, by-products, Ch'go ovens	8.00
Foundry, by-products, New England, del'd	11.00
Foundry, by-product, Newark or Jersey City, delivered	9.00 to 9.40
Foundry, by-product, Phila.	9.00
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry by-prod., del'd St. Louis	9.00

### Coal

Per Net Ton

Mine run steam coal, f.o.b. W. Pa. mines	\$1.35 to \$1.50
Mine run coking coal, f.o.b. W. Pa. mines	1.40 to 1.50
Gas coal, 3/4-in., f.o.b. Pa. mines	1.70 to 1.80
Mine run gas coal, f.o.b. Pa. mines	1.50 to 1.60
Steam slack, f.o.b. W. Pa. mines	.65 to .75
Gas slack, f.o.b. W. Pa. mines	1.00 to 1.15

### Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard	\$80.00 to \$85.00
Foreign, 80%, Atlantic or Gulf port, duty paid	.....

### Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	\$28.00 to \$30.00

### Electric Ferrosilicon

	Per Gross Ton Delivered
50%	\$88.50
75%	130.00

	Per Gross Ton Furnace	Per Gross Ton Furnace
10%	\$35.00	12%
11%	37.00	14 to 16%
12%	.....	39.00

### Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton	Per Gross Ton
10%	\$25.00	13%
11%	26.00	14%
12%	27.00	15%

### Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton	Per Gross Ton
6%	\$21.00	11%
7%	21.50	12%
8%	22.00	13%
9%	22.50	14%
10%	23.00	15%

Delivered prices at Chicago are about 50c. a ton below this schedule.

### Other Ferroalloys

Ferrotungsten, per lb. contained metal del'd

..... \$1.30 to \$1.40

Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr, per lb. contained Cr, delivered, in carloads

..... 11.00c.

Ferrochromium, 2% carbon, 17.00c. to 17.50c.

Ferrochromium, 1% carbon, 19.00c. to 20.00c.

Ferrochromium, 0.10% carbon, 24.50c. to 26.00c.

Ferrochromium, 0.06% carbon, 26.50c. to 28.00c.

Ferrovanadium, per lb. contained vanadium, f.o.b. furnace

..... \$3.15 to \$3.65

Ferrocobaltitanium, 15 to 18% per net ton, f.o.b. furnace, in carloads

..... \$160.00

Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton

..... \$91.00

Ferrophosphorus, electric 24% f.o.b. Alton, Ill., per gross ton

..... \$122.50

Silico-manganese, gross ton, delivered

..... \$135.00

### Fluxes and Refractories

#### Fluorspar

Per Net Ton

Domestic, 85% and over calcium fluoride, not over 5% silicon, gravel, f.o.b. Illinois and Kentucky mines	\$16.00
No. 2 lump, Illinois and Kentucky mines	20.00

Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	\$17.00 to 17.50
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2 1/2% silica, f.o.b. Illinois and Kentucky mines	32.50

#### Fire Clay Brick

Per 1000 f.o.b. Works

High-Heat Intermediate

Duty Brick Heavy Duty Brick

Pennsylvania	\$43.00 to \$46.00
Maryland	43.00 to 46.00
New Jersey	50.00 to 65.00
Ohio	43.00 to 46.00
Kentucky	43.00 to 46.00
Missouri	43.00 to 46.00
Illinois	43.00 to 46.00
Ground fire clay, per ton	7.00

#### Silica Brick

Per 1000 f.o.b. Works

Pennsylvania	\$43.00


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# Mill Prices of Finished Iron and Steel Products

## Iron and Steel Bars

### Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c. to 1.65c.
F.o.b. Chicago	1.70c.
Del'd Philadelphia	1.89c.
Del'd New York	1.93c.
F.o.b. Cleveland	1.65c. to 1.70c.
F.o.b. Lackawanna	1.70c.
F.o.b. Birmingham	1.75c. to 1.80c.
C.i.f. Pacific ports	2.25c.
F.o.b. San Francisco mills	2.25c.

### Billet Steel Reinforcing

	Base per Lb.
F.o.b. P'gh mills, 40, 50, 60-ft.	1.75c.
F.o.b. Birmingham, mill lengths	1.75c. to 1.80c.

### Rail Steel

	Base per Lb.
F.o.b. mills, east of Chicago dist.	1.50c. to 1.55c.
F.o.b. Chicago Heights mill	1.60c. to 1.65c.
Del'd Philadelphia	1.84c. to 1.89c.

### Iron

	Base per Lb.
Common iron, f.o.b. Chicago	1.70c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.09c.
Common iron, del'd New York	2.14c.

### Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c. to 1.65c.
F.o.b. Chicago	1.70c.
F.o.b. Birmingham	1.75c. to 1.80c.
Del'd Cleveland	1.78 1/2c. to 1.83 1/2c.
Del'd Philadelphia	1.80 1/2c.
F.o.b. Coatesville	1.70c.
F.o.b. Sparrows Point	1.70c.
F.o.b. Lackawanna	1.70c.
Del'd New York	1.88c.
C.i.f. Pacific ports	2.05c.

### Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c. to 1.65c.
F.o.b. Chicago	1.70c.
F.o.b. Birmingham	1.75c. to 1.80c.
Del'd Cleveland	1.78 1/2c. to 1.83 1/2c.
Del'd Philadelphia	1.80 1/2c.
F.o.b. Bethlehem	1.70c.
Del'd Cleveland	1.78 1/2c. to 1.83 1/2c.
Del'd Philadelphia	1.71c. to 1.76c.
Del'd New York	1.85 1/2c.
C.i.f. Pacific ports	2.15c. to 2.25c.

### Hot-Rolled Hoops, Bands and Strips

	Base per Lb.
6 in. and narrower, P'gh	1.65c.
Wider than 6 in., P'gh	1.55c.
6 in. and narrower, Chicago	1.75c.
Wider than 6 in., Chicago	1.65c.
Cooperage stock, P'gh	1.90c.
Cooperage stock, Chicago	2.00c.

### Cold-Finished Steel

	Base per Lb.
Bars, f.o.b. Pittsburgh mill	2.00c. to 2.10c.
Bars, f.o.b. Chicago	2.00c. to 2.10c.
Bars, Cleveland	2.00c. to 2.10c.
Bars, Buffalo	2.00c. to 2.10c.
Shafting, ground, f.o.b. mill	2.45c. to 3.40c.
Strips, P'gh	2.25c. to 2.35c.
Strips, Cleveland	2.25c. to 2.35c.
Strips, deliv'd Chicago	2.53c. to 2.63c.
Strips, Worcester	2.50c.
Fender stock, No. 20 gage, Pittsburgh or Cleveland	3.40c.

\*According to size.

### Wire Products

	Base per Keg
Standard wire nails	\$1.90 to \$2.00
Cement coated nails	1.90 to 2.00
Galvanized nails	3.95 to 4.05

### Base per Lb.

	Base per Lb.
Polished staples	2.35c. to 2.45c.
Galvanized staples	2.60c. to 2.70c.
Barbed wire, galvanized	2.55c. to 2.65c.
Annealed fence wire	2.05c. to 2.15c.
Galvanized wire, No. 9	2.50c. to 2.60c.
Woven wire fence (per net ton to re-tailers)	\$65.00

### To Manufacturing Trade

	Base per Lb.
Bright hard wire, Nos. 8 to 9 gage	2.20c. to 2.30c.
Spring wire (Carload lots, Chicago district mills)	3.30c.

	Base per Lb.
Wire nails	\$1.95 to \$2.05
Annealed fence wire	2.30c. to 2.40c. (lb.)
Bright hard wire to manufacturing trade	2.25c. to 2.35c.
Barbed wire, galv.	2.60c. (lb.)

Anderson, Ind., mill prices are ordinarily \$1 a ton over Pittsburgh base; Duluth, Minn., and Worcester, Mass., mill \$2 a ton over Pittsburgh, and Birmingham mill \$3 a ton over Pittsburgh.

### Light Plates

	Base per Lb.
No. 10, blue annealed, f.o.b. P'gh	1.90c.
No. 10, blue annealed, f.o.b. Chicago dist.	2.00c.
No. 10, blue annealed, del'd Phila.	2.19c.
No. 10, blue annealed, B'ham	2.05c.

### Sheets

#### Blue Annealed

	Base per Lb.
No. 13, f.o.b. P'gh	2.05c.
No. 13, f.o.b. Chicago dist.	2.15c.
No. 13, del'd Philadelphia	2.34c.
No. 13, blue annealed, B'ham	2.20c.

#### Box Annealed, One Pass Cold Rolled

	Base per Lb.
No. 24, f.o.b. Pittsburgh	2.35c.
No. 24, f.o.b. Chicago dist. mill	2.45c.
No. 24, del'd Philadelphia	2.64c.
No. 24, f.o.b. Birmingham	2.50c.

#### Continuous Mill Sheets

	Base per Lb.
No. 10 gage	1.75c.
No. 13 gage	1.90c.

#### Tin Mill Black Plate

	Base per Lb.
No. 28, f.o.b. Pittsburgh	2.60c. to 2.70c.
No. 28, f.o.b. Chicago dist. mill	2.75c. to 2.80c.

#### Automobile Body Sheets

	Base per Lb.
No. 20, f.o.b. Pittsburgh	3.30c.

#### Long Ternes

	Base per Lb.
No. 24, 8-lb. coating, f.o.b. mill	3.35c. to 3.45c.
No. 24, f.o.b. Pittsburgh	3.70c.

#### Vitreous Enamel Stock

	Base per Lb.
No. 24, f.o.b. Pittsburgh	3.70c.

### Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c. to 1.65c.
F.o.b. Chicago	1.70c.
F.o.b. Birmingham	1.75c. to 1.80c.
F.o.b. Lackawanna	1.70c.
F.o.b. Bethlehem	1.70c.
Del'd Cleveland	1.78 1/2c. to 1.83 1/2c.
Del'd Philadelphia	1.80 1/2c.
F.o.b. Coatesville	1.70c.
F.o.b. Sparrows Point	1.70c.
F.o.b. Lackawanna	1.70c.
Del'd New York	1.88c.
C.i.f. Pacific ports	2.05c.

### Hot-Rolled Hoops, Bands and Strips

	Base per Lb.
6 in. and narrower, P'gh	1.65c.
Wider than 6 in., P'gh	1.55c.
6 in. and narrower, Chicago	1.75c.
Wider than 6 in., Chicago	1.65c.
Cooperage stock, P'gh	1.90c.
Cooperage stock, Chicago	2.00c.

### Tin Plate

#### Per Base Box

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	\$5.00
Standard cokes, f.o.b. Gary	5.10

### Terne Plate

#### (F.o.b. Makers' mill)

	Alloy Quantity Bar Base, 2.65c. per Lb.
S.A.E. Series Numbers	Alloy Differential
2000 (14% Nickel)	\$0.25
2100 (14 1/2% Nickel)	0.55
2300 (3 1/2% Nickel)	1.50
2500 (5% Nickel)</	

## Fabricated Structural Steel

### Awards Total 37,000 Tons and Include Subway and State Capitol—New Projects 28,500 Tons

**A**WARDS of fabricated structural steel for the week total more than 37,000 tons, compared with only 9000 tons a week ago, when business was affected by the holidays. New projects are smaller this week, totaling about 28,500 tons, compared with 65,000 tons a week ago, when some substantial Federal and State inquiries were issued.

Included in large awards this week are 7300 tons for a section of New York subway, 4050 tons for the Louisiana State Capitol at Baton Rouge and 7500 tons in the Ogden Avenue viaduct, Chicago. New projects include 10,000 tons for a Post Office and Federal Court building in Boston, 1500 tons for a store building in Milwaukee, 1000 tons for a Y. M. C. A. building in New York, and 1750 tons for an auditorium at Pasadena, Cal. Awards follow:

#### North Atlantic States

FRAMINGHAM, MASS., 110 tons, telephone building, to A. O. Wilson Structural Co. PROVIDENCE, R. I., 100 tons, Brown University building, to a local fabricator. BROOKLYN, 2000 tons, Harway Avenue bridge, to Bethlehem Steel Co. NEW YORK, 2000 tons, Queens General Hospital to A. E. Norton Co. NEW YORK, 650 tons, apartment building at 29 West Ninetieth Street. NEW YORK, 7300 tons, section 9, route 107, subway, to American Bridge Co. STONEHARBOR, N. J., 250 tons sheet steel piling, coffer dams for bascule bridge, to Bethlehem Steel Co. SYRACUSE, N. Y., 500 tons, State Forestry Building, to McClintic-Marshall Co. GENESEO, N. Y., 200 tons, State Normal School, to McClintic-Marshall Co. PORTAGE, N. Y., 150 tons, Erie Railroad bridge, to American Car & Foundry Co. BALTIMORE, 280 tons, boiler supports for Consolidated Gas, Electric Light & Power Co., to Maryland Steel Products Co. PITTSBURGH, 480 tons, Arsenal High School, to McClintic-Marshall Co.

#### The South

WACO, TEX., 400 tons, power transmission line towers, to Nashville Bridge Co. BIRMINGHAM, 200 tons, Ensley plant of Birmingham Slag Co., to Ingalls Iron Works. ATLANTA, GA., 250 tons, office building remodeling, to Ingalls Iron Works. INVERNESS, Fla., 150 tons, highway bridge, to Ingalls Iron Works. BATON ROUGE, LA., 4050 tons, Louisiana State Capitol, to Lukens Steel Co.

#### Central States

FREELAND, MICH., 115 tons, highway bridge, to McClintic-Marshall Co. CLEVELAND, 500 tons, James Ford Rhodes School, to Ingalls Iron Works; previously reported to another fabricator. CLEVELAND, 350 tons, factory building for Yoder Co., to Truscon Steel Co. CANTON, OHIO, 600 tons, addition to plant of United Engineering & Foundry Co., to Gilbert Steel Co. JEFFERSONVILLE, IND., 200 tons, tow boat for Inland Waterways Corp., to Howard Shipyards & Dry Dock Co. WATERLOO, IOWA., 430 tons, highway bridge, to Clinton Bridge Works. DES MOINES, IOWA, 2000 tons, Iowa-Des Moines National Bank building, to Pittsburgh-Des Moines Steel Co. UNION PACIFIC RAILROAD, 1600 tons, viaduct work, to American Bridge Co. and McClintic-Marshall Co. KANSAS CITY, Mo., 700 tons, municipal plant, to Kansas City Structural Steel Co.

CHICAGO, 7500 tons, Ogden Avenue viaduct, to American Bridge Co.

#### Western States

COLUMBUS, NEB., 600 tons, highway bridge, to Paxton & Vierling Iron Works, Omaha. OGDEN, UTAH, 300 tons, Court House, to Denver Iron & Steel Co. SAN FRANCISCO, 125 tons, plates and shapes, lighthouse tender for Government, to Moore Dry Dock Co. SAN FRANCISCO, 300 tons, 75-ft. plate girders for Western Pacific Co., to Columbia Steel Co. SAN FRANCISCO, 100 tons, apartment building, Broadway and Webster Street, to Judson-Pacific Co. SACRAMENTO, CAL., 108 tons, bridge over Richardson Bay, Marin County, to Moore Dry Dock Co. SAN JOSE, CAL., 100 tons, gymnasium at Teachers' College, to Schrader Iron Works. COQUILLE, ORE., 271 tons, bridge over Isthmus Inlet, to an unnamed bidder. SEATTLE, 100 tons, miscellaneous work, to Wallace Bridge & Structural Steel Co. LEWIS RIVER, WASH., 1500 tons, dam gates, etc., for Northwestern Electric Co., to Willamette Iron & Steel Co. and Poole & McGonigle. EL CENTRO, CAL., 150 tons, exhibit building, to Consolidated Steel Corp. PASADENA, CAL., 1750 tons, auditorium, to Consolidated Steel Corp. SAN DIEGO, CAL., 325 tons, shop building for Naval Base, to McClintic-Marshall Co.

#### STRUCTURAL PROJECTS PENDING

Inquiries for fabricated steel work include the following:

#### North Atlantic States

BOSTON, 10,000 tons, Post Office and Federal Court building. BOSTON, 600 tons, New England Telephone Building. SPRINGFIELD, MASS., 800 tons, Post Office and Federal Court building. WATERTOWN, MASS., 400 tons, telephone company distributing plant. EVERETT, MASS., 140 tons, chemical manufacturing unit. HARTFORD, CONN., 100 tons, State bridge over Connecticut River. NEW YORK, 1000 tons, building for Railroad Y. M. C. A. STATES OF NEW JERSEY AND PENNSYLVANIA, 500 tons, highway bridge over Delaware River above Trenton. PHILADELPHIA, 2500 tons, Penn Avenue improvement, readvertised for bids. STONEHARBOR, N. J., 125 tons, bascule bridge.

FRENCHTOWN, N. J., 600 tons, elimination of toll bridge to Uhlerstown, Pa. WASHINGTON, 100 tons, roof of Army medical school.

#### The South

MARKSVILLE, LA., 700 tons, highway bridge.

#### Central States

TOLEDO, 250 tons, buildings for Libby Glass Co.; H. K. Ferguson Co., general contractor.

TOLEDO, 130 tons, Fieldback school.

MICHIGAN CITY, IND., 500 tons, bridge.

MILWAUKEE, 1500 tons, Chapman store. COOK COUNTY, ILL., 400 tons, highway bridge.

CHICAGO, 1400 tons, Illinois Motorists' Association; Paschen Brothers, general contractors.

BOONVILLE, Mo., 10,000 tons, bridge for Missouri-Kansas-Texas Lines.

#### Western States

LOS ANGELES, 640 tons, plates, 51-in. welded steel pipe; Western Pipe & Steel Co., low bidder.

SANTA ROSA, CAL., 365 tons, bridge over Russian River near Jenner; Pacific Coast Engineering Co., low bidder.

DENVER, 243 tons, tanks for United States Bureau of Reclamation at Boulder City; all bids rejected.

## U. S. Steel Employees Offered Stock at \$140

The United States Steel Corp. announced on Tuesday that, in accordance with its policy of offering stock to employees annually, it has decided to offer at this time 100,000 of its common shares at \$140 a share.

## Firmer Tone in Scrap at Detroit

DETROIT, Jan. 6.—Better operating schedules by steel mills have given a firmer tone to the scrap market. Aside from an advance of 25c. a ton on compressed sheets and machine shop turnings, prices have not changed. However, they are firm, and dealers believe that the next move will be upward.

*Dealers' buying prices per gross ton, f.o.b. cars, Detroit:*

Hvy. melting and shov. steel	\$9.50 to \$10.00
Borings and short turnings	5.00 to 5.50
Long turnings	4.00 to 4.50
No. 1 machinery cast	10.00 to 10.50
Automotive cast	11.50 to 12.00
Hydraul. comp. sheets	9.25 to 9.75
Stove plate	7.25 to 7.75
New No. 1 busheling	8.00 to 8.50
Old No. 2 busheling	3.50 to 4.00
Sheet clippings	6.00 to 6.50
Flashings	7.75 to 8.25

## Error in Advertisement

In a full page advertisement of the Champion Machine & Forging Co., 3695 East Seventy-eighth Street, Cleveland, appearing on page 295 of the Jan. 1 issue of THE IRON AGE, a typographical error made it appear that the company's equipment consists of hammers ranging from 800 to 1500 lb. capacity. The figures should have read: 800 to 15,000 lb.

# ▲▲▲ Non-Ferrous Metal Markets ▲▲▲

## Copper Steady—Tin Inactive —Lead and Zinc Lower and Dull

NEW YORK, Jan. 6.  
Copper

Buying by foreign consumers is fairly good thus far this year, but domestic buyers are taking practically nothing, being well covered through the first quarter. Prices are very firm and unchanged at 10.50c., delivered in the Connecticut Valley, for electrolytic copper and 10.50c. to 10.62½c., delivered, for Lake copper. The quotation of Copper Exporters, Inc., is 10.80c., e.i.f., usual European ports. Sales for export thus far this month have been about 4000 gross tons and the total for December is reported as approximately 31,000 tons. Primary producers are out of the market, custom smelters taking all the business. It is stated that thus far this month business booked has not been equal to the intake of custom smelters.

Statistics for December, to be published in about a week, are expected to show a further decrease in copper in the blister form and possibly a decrease in stocks of refined metal, but the fact that considerable metal, which has been sold, is still in the hands of producers may keep the total of refined stocks large.

### Copper Averages

The average price of Lake copper for December, based on daily quotations in THE IRON AGE, is 11.07c. a lb., delivered New York. The average price of electrolytic copper is 10.32c., refinery, or 10.57c., delivered in the Connecticut Valley.

### Tin

Owing to the holidays, not much business has been done. On only one day in the past week was there any activity, when on Saturday, Jan. 3, about 200 to 300 tons was sold, mostly for first quarter delivery. Prices are a little higher both here and in London, owing to a favorable report from miners in regard to the plan of restricting exports. Spot Straits tin today is quoted at 26.62½c., New York, with prices in London about £1 a ton higher than a week ago, with spot standard at £118 10s., future standard at £119 17s. 6d., and spot Straits at £122 15s. The Singapore price today is £124 5s.

Statistics for December show that deliveries into American consumption were larger than expected, at 7495 tons. The world's visible supply was

### THE WEEK'S PRICES. CENTS PER POUND FOR EARLY DELIVERY

	Jan. 6	Jan. 5	Jan. 3	Jan. 2	Dec. 31	Dec. 30
Lake copper, New York.....	10.62½	10.62½	10.62½	10.62½	10.62½	10.62½
Electrolytic copper, N. Y.*.....	10.25	10.25	10.25	10.25	10.25	10.25
Straits tin, spot, N. Y. ....	26.62½	26.87½	26.62½	26.25	26.25	26.50
Zinc, East St. Louis.....	4.10	4.10	4.12½	4.12½	4.12½	4.12½
Zinc, New York.....	4.45	4.45	4.47½	4.47½	4.47½	4.47½
Lead, St. Louis.....	4.80	4.80	4.95	4.95	4.95	4.95
Lead, New York.....	5.00	5.00	5.10	5.10	5.10	5.10

\*Refinery quotation; price ¼c. higher delivered in the Connecticut Valley.

increased last month by 1687 tons, the total on Dec. 31 having been 42,498 tons, which is large. Straits shipments for December were heavy at 7065 tons. Stocks of metal in British warehouses on Jan. 3 were 22,135 tons, a decrease of 19 tons, which was due partly to a shipment of 6501 tons on the Baltic to this country.

### Lead

For the first time since Oct. 10, the American Smelting & Refining Co. has changed its contract basing quotation, a reduction from 5.10c. to 5c., New York. The corresponding price at St. Louis is now 4.80c. It is understood that this change was made partly to stimulate business, which has been very light recently. Consider-

able business is still to be booked for January, and very little has been ordered for February, although producers' books are now open for that month.

### Zinc

After remaining fairly firm for several days at 4.12½c., East St. Louis, the quotation for prime Western zinc eased off yesterday to 4.10c., or 4.45c., New York, due to poor demand. Statistics for December, out today, are quite favorable to sellers. Stocks of refined metal on Jan. 1 were lower by about 15,000 tons than on Dec. 1 and shipments for the month were nearly 4000 tons larger, with production at approximately the same rate as November. On Jan. 1 there were about

### New York, Chicago or Cleveland Warehouse

#### Delivered Prices, Base per Lb.

High brass .....	17.37½
Copper, hot rolled, base sizes.....	20.25c.
Copper, cold rolled, 14 oz. and heavier, base sizes.....	21.75c.
<b>Seamless Tubes—</b>	
Brass .....	22.00c.
Copper .....	21.25c.
<b>Brass Rods .....</b>	<b>15.67½</b>
<b>Brazed Brass Tubes.....</b>	<b>24.87½</b>

### New York Warehouse

#### Delivered Prices, Base per Lb.

Zinc sheets (No. 9), casks .....	9.75c. to 10.25c.
Zinc sheets, open.....	10.75c. to 11.25c.

### Metals from New York Warehouse

#### Delivered Prices, per Lb.

Tin, Straits pig.....	29.50c. to 30.50c.
Tin, bar .....	30.50c. to 31.50c.
Copper, Lake .....	11.50c. to 12.00c.
Copper, electrolytic .....	11.25c. to 11.75c.
Copper, casting .....	11.00c. to 11.50c.
Zinc, slab .....	5.50c. to 6.50c.
Lead, American pig .....	6.00c. to 7.00c.
Lead, bar .....	8.00c. to 9.00c.
Antimony, Asiatic .....	10.00c. to 10.50c.
Aluminum, No. 1 ingots for remelting (guaranteed over 99% pure) .....	24.00c. to 25.00c.
Alum. ingots, No. 12 alloys .....	23.00c. to 24.00c.
Babbitt metal, commercial grade .....	25.00c. to 35.00c.
Solder, ½ and ¼ .....	20.00c. to 21.00c.

### Metals from Cleveland Warehouse

#### Delivered Prices, per Lb.

Tin, Straits pig.....	30.25c.
Tin, bar .....	32.25c.
Copper, Lake .....	11.63c.
Copper, electrolytic .....	11.63c.
Copper, casting .....	11.25c.
Zinc, slab .....	5.50c.
Lead, American pig .....	8.75c. to 6.00c.
Lead, bar .....	8.50c.
Antimony, Asiatic .....	11.00c.
Babbitt metal, medium grade .....	15.25c.
Babbitt metal, high grade .....	34.50c.
Solder, ½ and ¼ .....	19.75c.

### Old Metals, Per Lb., New York

*Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged consumers after the metal has been properly prepared for their uses.*

Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy, crucible .....	8.50c.
Copper, hvy, and wire .....	8.25c.
Copper, light and hot-toms .....	7.25c.
Brass, heavy .....	5.00c.
Brass, light .....	4.25c.
Hvy. machine composition .....	7.25c.
No. 1 yel. brass turnings .....	5.25c.
No. 1 red brass or composition turnings .....	7.00c.
Lead, heavy .....	4.00c.
Lead, tea .....	2.50c.
Zinc .....	2.25c.
Sheet aluminum .....	7.50c.
Cast aluminum .....	5.00c.

630 less retorts operating than on Dec. 1.

#### Antimony

Owing to the fact that spot stocks of antimony are closely held here and because the market in China is firmer, quotations here are higher with prompt delivery quoted at 7.30c., New York, duty paid, and with futures at 7.25c.

#### Nickel

According to long-established prices, wholesale lots of ingot nickel are quoted unchanged at 35c. a lb., with 36c. for shot nickel and 35c. for electrolytic in cathodes.

#### Aluminum

Virgin metal, 98 to 99 per cent pure, is obtainable at the published price of 22.90c. a lb., delivered.

#### Non-Ferrous Metals at Chicago

CHICAGO, Jan. 6.—Consumer interest in this market is low and prices are variable. Copper has settled to the low figure of last week's spread while tin has advanced and lead quotations are lower. The old metal market is quiet.

*Prices per lb. in carload lots:* Lake copper, 10.62½c.; tin, 27.75c.; lead, 5c.; zinc, 4.20c.; in less-than-carload lots, antimony, 8.25c. On old metals we quote copper wire, crucible shapes and copper clips, 7.75c.; copper bottoms, 6.75c. to 7.25c.; red brass, 6.75c. to 7.25c.; yellow brass, 4.75c. to 5.25c.; lead pipe, 3.75c. to 4c.; zinc, 1.25c. to 1.50c.; pewter, No. 1, 14.75c.; tin-foil, 15.75c.; block tin, 21.75c.; aluminum, 6.25c. to 6.75c.; all being dealers' prices for less-than-carload lots.

#### Automobile Output in U. S. in November 129,437 Units

Output of motor vehicles in the United States in November, 1930, totaled 129,437, compared with 150,044 in October and 217,573 in November, 1929, according to the Bureau of the Census. Passenger car production in November, 1930, totaled 97,528 units, against 112,209 in October, while the output of trucks was 31,300, compared with 37,244, and taxicabs numbered 609 and 591 respectively.

Canadian motor vehicle production in November, 1930, totaled 5407 units, against 4541 in October and 9424 in November, 1929. The November, 1930, output of passenger cars was 3527, compared with 3206 in October, while the output of trucks totaled 1880 and 1335 respectively.

During 1930, 57 new industries were established in the St. Louis industrial district and 91 existing industries undertook expansions, according to the report of George C. Smith, director of the industrial bureau of the St. Louis Industrial Club.

## Reinforcing Steel

#### Awards and Inquiries in Larger Volume

REINFORCING steel lettings the past week totaled 3100 tons, compared with 1330 tons in the previous week. Contracts were mostly for small lots; the largest, 600 tons, is for a hotel in Washington. New projects on which bids have been asked call for 6950 tons and include three jobs of 1000 tons each and 1500 tons for a Post Office and Federal Court building in Boston. Awards follow:

NEWTON, MASS., 115 tons, culvert, to Northern Steel Co.

CLARKSBURG, W. VA., 125 tons, Post Office and Court House, to Truscon Steel Co.

WASHINGTON, 600 tons, Dupont Circle hotel, to Capital Fireproofing Co.

SPRINGFIELD, ILL., 200 tons, sewage treating plant, to an unnamed bidder.

DAVENPORT, IOWA., 270 tons, theater, to Laclede Steel Co.

ST. LOUIS, 130 tons, building for School of Finance and Commerce of St. Louis University, to Missouri Rolling Mills Corp.

COQUILLE, ORE., 400 tons, bridge over Isthmus Inlet, to an unnamed bidder.

SEATTLE, 100 tons, apartment building, Ninth Avenue, to Pacific Coast Steel Corp.

SEATTLE, 125 tons, Cedar River pipe line, to Northwest Steel Rolling Mills.

OLYMPIA, WASH., 100 tons, approaches for Snoqualmie River bridge, to Pacific Coast Steel Corp.

LOS ANGELES, 200 tons, store, Eighth and Wall Streets, to Concrete Engineering Co.

COMPTON, CAL., 250 tons, mausoleum, to Soule Steel Co.

PASADENA, CAL., 500 tons, auditorium, to unnamed bidder.

#### Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

BOSTON, 1500 tons, Post Office and Federal Court building.

BOSTON, 350 tons, Professional Arts building superstructure.

STATE OF MASSACHUSETTS, 1000 tons, two highway projects.

WATERTOWN, MASS., 1000 tons, New England Telephone & Telegraph Co. distributing building.

SPRINGFIELD, MASS., 300 tons, Post Office and Federal Court building.

NORRISTOWN, PA., 200 tons, sewage disposal plant.

HAMPTON ROADS, VA., 1000 tons, five barracks for United States Marine Corps.

NEW YORK, 550 tons, Kill van Kull bridge; bids opened Jan. 12.

NEW YORK, 500 tons, approaches to Hudson River Bridge at Fort Lee, N. J.

WASHINGTON, 400 tons, Army Medical School, Walter Reed Hospital; bids taken Jan. 6.

PITTSBURGH, 140 tons, Arsenal High School; Pittsburgh Engineering & Construction Co., general contractor.

#### Company Policies During Reduced Employment

WASHINGTON, Jan. 6.—Prepared by the President's Emergency Committee for Employment, distribution was begun yesterday of an outline of suggested policies and practices for industries during reduced employment and operation.

Based on a study of steps taken by hundreds of companies to meet the present unemployment emergency, the suggestions are designed to make available knowledge of these measures to both large and small companies. An additional pamphlet describes a survey of emergency measures in industry, founded on information gathered from a diversified list of large and small corporations manufacturing in more than 500 locations and employing in 1929 more than 750,000 men. The survey indicates the extended and various methods of attacking the employment problem which are being used in the emergency.

The methods of spreading employment include: Reduced weekly schedules through the five, four and three-day week; reduced daily schedules through the seven, eight, or six-hour day; shorter shifts in continuous operations, such as four or six shifts a day; alteration of shifts or individuals on the same job, known as "staggering," and rotation of days off.

Among measures to increase the amount of work available, industrial executives, it is pointed out, are doing more extensive repair and mainte-

nance work, as well as hastening replacement of wornout or obsolete equipment. Many companies are constructing permanent improvements. Others are finding it practical to manufacture certain commodities for future demand.

Attempts are being made to reach new levels of consumption through new and improved products, decreased prices, extensive advertising and more scientific salesmanship.

Copies of these pamphlets are being given wide distribution by trade associations and other bodies. They may also be secured from the President's unemployment committee or from the Government Printing Office, both in Washington.

Harnischfeger Corp., Milwaukee, which acquired the Milwaukee Electric Crane & Hoist Corp. in 1928 and has since been operating it with separate sales organizations, has consolidated these sales organizations, with D. B. Patterson, general manager for the Milwaukee Electric Crane & Hoist Corp., and vice-president of the Harnischfeger Corp., in charge of crane and hoist sales, and N. P. Farra in charge of industrial sales. Production will be continued in both plants.

The Federal Shipbuilding Co., Kearny, N. J., subsidiary of the United States Steel Corp., has received a contract for four ships to cost \$17,000,000 for the Panama Mail Steamship Co. The first of the ships will be delivered in about 20 months.

# Detroit More Cheerful as Motor Car Plants Resume Production

DETROIT, Jan. 6.

**D**EVELOPMENTS in the past week in the automobile industry have been on the favorable side. Although no official announcement has yet been made, indications are that December output may have reached 150,000 units, exceeding that in the same month of 1929 by 25,000 cars. This is a surprising increase. Not only was the record of the final month of 1929 broken, but the past month's output exceeded that of November by about 16,000 units, thereby reversing the seasonal trend for the first time in many years. The gain was made largely through Chevrolet's production of 64,000 cars and despite shutdowns of large companies, including Ford, the latter part of the month.

Employees in the final assembly, body assembly and enameling departments of the Ford Motor Co. returned to work Monday. Men in the foundry machine shop who work on valves, sediment bulbs and Lincoln parts also resumed activities. All other departments, shut down since Dec. 18, will get under way again on Jan. 12. Closed since Dec. 15, the Buick Motor Co. on Monday got into production at Flint. This means that the Fisher body plant at Flint, which manufactures Buick bodies, is again operating. The Cadillac plant in Detroit likewise began turning out cars Monday following a two-weeks' suspension of work for inventory purposes. It is now employing 6000 men. The Oldsmobile division of General Motors has added a considerable number of workers. Chevrolet is constantly increasing its forces, which now are well above the 30,000 mark, with 40,000 as the ultimate goal. Its gray iron foundry at Saginaw is putting on a night shift this week and will soon be pouring iron at close to full capacity. Aside from motor car factories, parts makers have benefited from the industry's pickup. The Briggs Mfg. Co., Murray Body Corp., Kelsey-Hayes Wheel Corp. and A. C. Sparkplug Co. are a few of the plants which have been stimulated. A total of 22,000 workers returned to duty in Detroit automobile plants this week.

All of this is evidence that Detroit is preparing for "the big push" of the January automobile shows and attention is centering on what manufacturers are planning to offer as a buying incentive to the public. Although the edge has been taken off the annual

Final assembly, body assembly, enameling and part of foundry machine shop departments of Ford's Rouge plant resumed work Jan. 5; other departments will begin operating again Jan. 12.

\* \* \*

Buick and Cadillac plants opened this week; Chevrolet gradually adding 10,000 men to reach soon a maximum of 40,000 employees.

\* \* \*

First quarter's motor car output not likely to be more than 700,000 units, a substantial decrease from last year's performance during the similar period.

\* \* \*

Chevrolet estimated to have manufactured 40 per cent of all motor cars in December.

event by the preliminary presentations of numerous makers, some of the thrill of the opening of the 1931 season remains. In most cases the depression has not disheartened production and sales executives; it has prodded them to greater efforts to regain lost ground.

## Chrysler Offers New Six

**A**MONG the new cars shown in New York this week is a Chrysler six patterned after the Chrysler eight. It has a slanting V-type radiator, all-steel body, 116-in. wheelbase and an overall length of 175 1/2 in. The windshield, which tilts outward, is framed in chromium; there is no visor. The engine is of the high-compression type pioneered by Chrysler. It is equipped with steel-strut, aluminum alloy pistons with floating piston pins of chrome-nickel alloy steel. The car has the Chrysler-originated, double-drop chassis frame 6 1/2-in. deep, with maximum width of frame flange of 2 in.

DeSoto Motor Corp., Chrysler subsidiary, is exhibiting a new six and an eight. Both cars have increased horsepower and many refinements which give them a fleeter appearance. The eight has the down-draft carburetion system, all-steel body and redesigned hardware. Fenders and other enameled parts are bonderized; other parts subject to the effects of rust

are parkerized and sherardized. The DeSoto has followed Buick's practice of putting its crest on the headlamp cross-rod instead of on the radiator shell. The eight is being sold at about the same price as formerly, but the six is lower. It is understood that many parts on the DeSoto and Chrysler six will continue to be interchangeable. One story going the rounds is that Walter P. Chrysler is spending considerable time in Detroit and has taken over personal direction of activities which in recent months he had delegated to others.

Peerless is introducing a new straight eight with engine of 120 hp. and wheelbase of 125 in. As in the Chrysler and DeSoto models, the visor is eliminated. The DeLuxe Master series has the chromium-plated radiator shield first used by Cadillac and recently added by several makers. Metal tire covers, the tops of which are chromium-plated, are standard equipment. Incidentally, Peerless is offering the "all-over" color arrangement in which a single color is used throughout the entire exterior of the car instead of a combination of a color with black or a harmonizing trim. Cylinders of the L type engine are cast en bloc integral with the crankcase. Four-wheel brakes are cable controlled; that is, the cable itself is contained in a sealed metal conduit which is packed in lubricant, thus eliminating rattles, squeaks and the necessity for lubrication or minor adjustments.

## Oakland-Pontiac Quotes Delivered Prices

**T**HE 1931 Oakland eight and Pontiac six models are quoted at delivered prices with the cars fully equipped, thereby following the policy adopted last fall by the Nash company. Delivered in Detroit, the Pontiac ranges from \$725.50 to \$835.50, a considerable reduction from last year's prices. The Oakland is being sold at \$950.50 to \$1,050.50. The Oakland has retained the V-type power plant which now develops 85 hp. The synchro-mesh transmission, a new feature, allows gear shifting up to 45 to 50 miles per hr. The wheelbase is 117 in. The Pontiac wheelbase has been lengthened to 112 in. and the engine develops 60 hp. Both the Oakland and Pontiac have AC intake silencers which cancel out power roar at high speed. Both engines likewise have a new type of electro-plated

pistons. Both cars have the popular built-in radiator screens.

The foundry trade is feeling the good effects of resumption of work by automobile factories. The Wilson foundry at Pontiac has increased production considerably the past few weeks, while the Oakland foundry, which was practically shut down for a long period, is operating at a fair rate. Cadillac and Packard foundries again are pouring iron after being closed for several weeks; the Studebaker foundry also is reported to be running on a moderate scale. Chevrolet's foundry at Saginaw operated three days during each of the last two holiday weeks, but increased its output on those days to take care of normal volume for the entire two weeks. Saginaw malleable foundry is busy on Chevrolet work, and several small foundries in Michigan also have good programs for the current month. Two large foundries at Muskegon are said to be engaged on a curtailed basis.

#### Chevrolet Guarantees Work to Employees

CHEVROLET has put into operation a plan which should be helpful to its workers during the present period of widespread unemployment. Its December output was about 60,000 units, with 75,000 set for January. It will increase its production until a maximum of 40,000 men are employed, giving work to that number during the next two or three months without regard to retail sales of Chevrolet cars. Finished parts will be made and stored ready to go to assembly lines at various plants. Parts can be banked economically, whereas it would be impractical to attempt to store finished cars if by chance the retail market would not absorb the output contemplated by this plan. Detroit regards this move as a constructive effort on the part of the Chevrolet company to meet the present emergency. So far as retail demand is concerned, however, there is no denying that the new Chevrolet has taken well with the public.

WHAT January production of motor cars will be is anyone's guess. However, the more conservative observers believe that it will be around 175,000 cars. No one familiar with the situation is hopeful that the first quarter's volume will approach that in the same quarter last year. The early months of 1930 were much nearer normal than the later ones; therefore the fact that production in the next 90 days is almost certain to fall behind last year's performance is not likely to have a depressing effect and has already been largely discounted. The quarter's output probably will not be over 700,000 cars and may not attain that figure.

The increased intensity of competition in automobile manufacturing does not seem to discourage newcomers, for concurrent with the announcement of the Martin and DeVaux cars

#### 1930 AUTOMOBILE PRODUCTION

Preliminary figures of the National Automobile Chamber of Commerce on the automobile industry in 1930 are as follows:

Cars and trucks produced in United States and Canada	3,505,000
Cars	2,943,200
Trucks	561,800
Production of closed cars	2,688,000
Per cent closed cars	91
Number of American motor vehicles sold outside United States (United States exports and output in United States owned Canadian plants)	561,000
Per cent decrease in foreign sales from 1929	44
Per cent of production sold outside United States	16

is news of the revival of operations by the Davis Motor Car Co., Inc., which will make sixes and eights, transferring its factory from Richmond, Ind., to Baltimore. There the Davis and its companion car, the New York six, will go into production early in 1931 on a full line of models selling at \$445 to \$1,995. In the \$500 class the cars will carry new trade names not yet disclosed. The company is a division of Automotive Corp. of America.

#### Small Tools, Accessories at \$166,537,066 in 1929

WASHINGTON, Jan. 6.—Based on f. o. b. factory prices, the total value of machine tool accessories and small metal-working tools manufactured in the United States in 1929 by 722 establishments was \$166,537,066, according to the Bureau of the Census. Of this total, \$111,833,929 was contributed by attachments and fixtures and \$54,703,137 by small tools. The largest item was \$44,814,512, representing the value of sub-presses, punches, dies, etc. The statistics are the first for these products ever presented by the bureau.

Of the total production, \$134,194,194 was reported by establishments engaged primarily in the manufacture of machine tool accessories and small metal-working tools, and the remaining \$32,342,872 represented the value of such accessories and tools made as secondary products by establishments engaged primarily in the manufacture of machine tools and of stamped ware, enameled ware, metal stamping, etc.

As defined by the bureau, this industry embraces establishments whose principal products are twist drills,

reamers, milling cutters, taps, dies, jigs, fixtures and special tools. The report points out that it is understood that a considerable amount of such products is manufactured in establishments engaged primarily in the manufacture of machine tools and in the commercial metal-stamping industry.

The establishments which are classified were previously classified in the following industries: Cutlery and edge tools, machine tools and metal-working machinery and foundry and machine shop products, but no comparable data are available for previous censuses.

#### Expect Smaller Shipments Than in 1930 First Quarter

WASHINGTON, Jan. 6.—Shipments of iron and steel products in the first quarter of 1931 will total 403,739 carloads, according to estimates submitted to the Shippers' Regional Advisory Boards, American Railway Association. This is a reduction of 13 per cent from shipments in the first quarter of 1930, amounting to 463,926 carloads.

Shipments of machinery and boilers are estimated at 39,714 carloads, a reduction of 20.9 per cent under 50,189 carloads shipped in the corresponding quarter one year ago. Other estimates are coal and coke, 2,379,632 carloads, a reduction of 3.8 per cent from 2,473,227 shipped in the first quarter of 1930; ore and concentrates, 103,021 carloads, a reduction of 14.4 per cent from the 120,359 carloads shipped in the corresponding period one year ago; automobiles, trucks and parts, 160,805, a reduction of 13.4 per cent from the 185,753 carloads shipped in the first quarter one year ago; and agricultural implements and vehicles, 30,583, a reduction of 20.7 per cent from the 38,563 shipped in the first quarter of 1930.

For the total 29 principal commodities considered by the boards, it is estimated first quarter shipments for the current year will be about 6,568,456 cars, a reduction of 380,607 cars or 5.5 per cent under the corresponding period of 1930.

#### Automobile Obsolescence 3,000,000 Cars in Year

Estimating automobile production in 1930 at 3,450,000 cars and trucks, and reduction of dealers' stocks by 200,000, Brookmire Economic Service shows how the 3,650,000 units went into use. To replace worn-out vehicles, 3,000,000 were required. New users accounted for 250,000, and exports, including foreign assemblies, for 400,000.

These figures are for new cars only. Stocks of used cars are said to have been reduced by 250,000 during the year.

## PERSONALS

LEIGH B. MORRIS, who was New York district sales manager for the Midvale Steel & Ordnance Co. prior to its purchase by the Bethlehem Steel Corp., and later the representative of Bethlehem on the Pacific Coast, has acquired a half interest in the McGirr Sales Co., Bank of America Building, Los Angeles, Cal. The McGirr company is sales representative on the Pacific Coast for the Pittsburgh Screw & Bolt Corp., Pittsburgh; Newton Steel Co., Newton Falls, Ohio, and the Standard Steel & Wire Works, 4111 Henderson Street, Chicago.

E. L. ESSLEY, president, E. L. Essley Machinery Co., Chicago, left Jan. 3 for a winter vacation in Florida.

A. D. ENGLE has been appointed district sales manager of a Boston office that has been opened by the Austin Co., Cleveland, at 809 First National Bank Building, 1 Federal Street. He has been with the Austin Co. 10 years and was formerly sales engineer at its New York office.

HAROLD S. FALK, vice-president and works manager, Falk Corp., Milwaukee, has been appointed a member of the Wisconsin State Board of Vocational Education to succeed E. J. Kearney, secretary and treasurer, Kearney & Trecker Corp., who recently was tendered reappointment but declined, having served since the board was created. Mr. Falk is also a member of the Milwaukee Board of Vocational Education; chairman, apprentice committee, Milwaukee chapter, National Metal Trades Association; chairman, national educational committee, National association, and member of the educational committee, American Society of Mechanical Engineers. He is co-author of a series of lessons being used in plants throughout the country in factory foremanship schools.

A. D. CHISHOLM, manager of the Michigan group of mines of Pickands, Mather & Co., has been appointed assistant general manager, with headquarters at Duluth, Minn. He is succeeded by RICHARD P. ZINN, who has been superintendent of the Newport and Cary mines at Ironwood, Mich.

RICHARD JONES, JR., for many years secretary and chief counsel of the Republic Steel Corp. and its predecessor, the Republic Iron & Steel Co., has resigned. Mr. Jones is the last of the old executive staff of the former company to leave the organization. He started with the Republic company in 1889, and had served it

continuously since then. Mr. Jones intends to take a rest before assuming new duties. For the time being, the company will not select a new general counsel, but the work will be taken over by Cleveland and Youngstown law firms.

CUMMINGS C. CHESNEY, vice-president of the General Electric Co., retired on Jan. 1. Mr. and Mrs. Chesney recently returned from an extended European trip.

FREDERICK F. BRAND has been made managing engineer of the General Electric Co., Pittsfield, Mass., transformer department.

HARRY W. KING, head of the engineering department of the Morgan Engineering Co., Alliance, Ohio, has been appointed assistant vice-president of the Aetna-Standard Engineering Co., Youngstown. Mr. King served for many years as assistant to C. L. TAYLOR, formerly vice-president of the Morgan company, and will now rejoin Mr. Taylor in the same capacity in the Aetna-Standard organization.

JOHN M. GROSS, vice-president in charge of traffic, Bethlehem Steel Corp., Bethlehem, Pa., was severely injured last Sunday by a fall from a horse.

DR. EDWARD E. MARBAKER, vice-president, Industrial Research & Engineering Co., Pittsburgh, consultant on foundry practice and general chemical problems, will speak at a meeting of the Pittsburgh Foundrymen's Association, to be held at the Fort Pitt Hotel, Pittsburgh, on Thursday evening, Jan. 15. Dr. Marbaker will discuss the recommendations of the American Foundrymen's Association's subcommittee on cupola operation as published in a recent issue of the association's transactions.

F. DUDLEY SHAW, formerly assistant secretary of Henry Gardner, Guiterman & Co., of New York, became associated on Jan. 2 with Castwell & Starke, Inc., 17 State Street, New York, importer of tin.

HARRY S. RANSOM has been appointed manager of sales of the Fort Pitt Steel Casting Co., McKeesport, Pa. After a few years' absence from the steel foundry industry, he returned last spring as special representative of the sales and engineering department at Fort Pitt.

FREDERICK C. BRUNKE, for 20 years Toronto manager for the United States Steel Products Co., has re-

signed and will engage in a similar line of business on his own account.

HERBERT M. ORSCHEL has been made field sales manager of the Oeroil Burner Co., Inc., West New York, N. J.

F. W. DEPPE, formerly district sales representative at St. Louis for the Reading Iron Co., Reading, Pa., has been appointed general manager of sales, with offices at 230 Park Avenue, New York.

L. W. GREVE, active head of the Cleveland Pneumatic Tool Co., Champion Machine & Forging Co. and the Cleveland Rock Drill Co., has been made president of National Air Races, Inc., a non-profit group of business men who have arranged to underwrite and sponsor the annual national airplane races in Cleveland for the next 10 years.

ROLAND N. JESSOP has become assistant sales manager of the Ohio Electric Mfg. Co., Cleveland.

C. R. MESSINGER, president, Chain Belt Co., Milwaukee, has been elected president of the Oliver Farm Equipment Co. He has been active in the management of the Chain Belt Co. for the past 14 years and is chairman of the board of the Sivyer Steel Casting Co., and vice-president of the Federal Malleable Co., Milwaukee.

JAMES K. AIMER has become assistant general manager of sales in charge of railroad, locomotive and car equipment sales, also bar iron and billet sales for the Reading Iron Co., Reading, Pa. In addition, he will direct the sales of the company's charcoal iron boiler tubes, formerly under the direction of G. H. WOODROFFE, metallurgical engineer, who will now handle all complaints and serve in an advisory capacity to the general sales organization with respect to technical problems.

CHARLES F. ABBOTT, executive director of the American Institute of Steel Construction, has been elected vice-president of the National Council of Traveling Salesmen's Associations.

HENRY FISCHBECK, metallurgist, Pratt & Whitney Co., Hartford, Conn., spoke on "Metallurgy in Aircraft Motor Construction" at the seventeenth regular meeting of the New Jersey chapter of the American Society for Steel Treating, at the Berwick Hotel, Newark, N. J., Jan. 6.

ERNST KERL, formerly engineer at steel mills in the Ruhr district in

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Germany, has been appointed general manager of the new plant at Pretoria, being constructed by the South African Iron & Steel Industrial Corp.

F. W. PEEK, JR., has been appointed chief engineer of the Pittsfield, Mass., works of the General Electric Co., effective Jan. 1. He succeeds Giuseppe Faccioli, who retired a few months ago from active work because of ill health. Mr. Peek, who has been a consulting engineer of the company at Pittsfield, entered the company following graduation from Leland Stanford University in 1905. When the consulting engineering department was formed by Dr. Charles P. Steinmetz in 1909, Mr. Peek was one of the first to join it. He has since done general consulting work on practical and theoretical engineering problems and research. In 1911 he received the degree of master of electrical engineering from Union College, for work in high-voltage transmission.

E. W. SMITH, vice-president of the Pennsylvania Railroad, in charge of the Central Region, with headquarters at Pittsburgh, has resigned to become co-receiver for the Seaboard Air Line. He has spent many years in his recent capacity at Pittsburgh.

HARRY E. ROGERS has been appointed works manager of the Eastern division of the General Steel Castings Corp., at Eddystone, Pa., succeeding E. Walcher, who has resigned. Mr. Rogers has had 18 years' experience with the Commonwealth Steel Co., now a division of the General Steel Castings Corp., beginning in 1912 as a draftsman in the engineering department. He was soon transferred to the finishing department, and in December, 1913, was appointed assistant superintendent of that department. In 1917, he became superintendent of the finishing department, and on Jan. 1, 1930, he was appointed assistant to the works manager, retaining also the general supervision of the finishing department.

J. J. DUNN, recently general superintendent at Ellwood City, Pa., works, National Tube Co., has been appointed assistant to vice-president, with headquarters at the company's general offices in Pittsburgh. He has been succeeded by J. W. OFFUTT, who in turn has been succeeded by G. E. MOYER as assistant general superintendent of Ellwood City works. E. W. BROWN has been appointed general superintendent of the company's Lorain, Ohio, works, succeeding CHARLES FELL, who has retired from active service. J. L. MAUTHER and P. P. REESE have been appointed assistant general superintendents at Lorain works.

Lake Superior Iron Ore Association has removed its office to 1154 Union Trust Building, Cleveland.

WILLIAM GARDNER, senior vice-president and a director of the United Engineering & Foundry Co., Pittsburgh, died at his home in that city on Dec. 28, following a brief illness. He had been active in the sale of rolls and rolling mill equipment for almost 40 years, most of that time with the United company and its predecessors. Born in Scotland on March 3, 1865, he came to this country when 14 years of age and in 1891 became associated in a sales capacity with the Mesta



William Gardner

ROSWELL W. SMITH, president of Albert Smith & Sons, died suddenly at his home in Milburn, N. J., on Dec. 28, aged 46 years. He succeeded his father, the late George A. Smith, in the steel business, which had been founded some 75 years ago in Newark, N. J.

RICHARD W. DONIGAN, formerly president of the Todd-Donigan Iron Co., Louisville, Ky., died at his home in that city on Dec. 29, aged 76 years. He entered the service of the American Rolling Mill Co. at the age of 16. He later joined the staff of the Belknap Hardware & Mfg. Co., but left that organization in 1881 to become one of the founders of the iron company. He retired from the presidency in July, 1929, having rounded out 20 years as president.

LOUIS VIERLING, chairman of the board, Vierling Steel Works, Chicago, and secretary-treasurer, Paxton-Vierling Iron Works, Omaha, Neb., died Dec. 27 at his home in Chicago. He entered business in 1872 with the Union Iron Works, Chicago, and became secretary-treasurer of the Vierling McDowell Co. in 1882. He became president of the company in 1906, following the death of his brother, who had been one of the founders. The name of the company was then changed to Vierling Steel Works and Louis Vierling became chairman of the board.

JOSEPH E. BARRETT, president, Joseph E. Barrett Co., Detroit, maker of mechanical conveying machinery, died at his home on Dec. 22. For the past eight years he had been head of his own company, but previously was superintendent of the Palmer-Bee Co., Detroit.

GEORGE T. GODDARD, engineer in charge of electrical equipment of the Illinois Central Terminal, Chicago, and one of those who installed the electrified service of that railroad, was fatally injured Jan. 2 when struck by a northbound suburban train. He was 45 years old and had held the position of electrical engineer of equipment for six months.

WILLIAM HEINTZ, president, Heintz Steel & Mfg. Co., St. Louis, died at his home there recently, aged 47 years. He was born and educated in St. Louis and before organizing his own company six years ago was connected with the Wangler Boiler Works Co.

EZRA D. DAVIDSON, sales engineer, Farrel-Birmingham Co., Ansonia, Conn., died Dec. 30, aged 44 years. He had been with the company all his

business life, and specialized on rubber and rubber machinery, on which he was considered an authority.

NOAH W. ELLIOTT, SR., president and treasurer of the Elliott-Blair Steel Co., New Castle, Pa., died of pneumonia at his home in that city on Dec. 24. He was born in Pitts-



Noah W. Elliott, Sr.

burgh 60 years ago, but had been engaged in the strip steel business at New Castle since 1892. His first association with the steel industry was with the Crescent Steel Co. at Pittsburgh in 1876.

WILLIAM FLETCHER BARNES, one of the founders of the W. F. & John Barnes Co., Rockford, Ill., died at his home in that city on Dec. 28, aged 89 years. A native of New York State, he went to Rockford in 1861, joining his brother John, a member of Barnes & Boynton, manufacturers of seeders. In 1872 he and his brother organized the company bearing their names and began manufacture of jig saws. Later they took up the building of small lathes, drill presses, radials and other machine tools, which found a considerable market, including export fields. Two of the company's early models are among the exhibits of early machinery in Henry Ford's Edison Museum at Detroit. Mr. Barnes had not been active in his industrial enterprises for more than a quarter of a century.

WALTER E. NICHOLS, who until he retired from business in 1920 was president of the American Tap & Die Corp., Greenfield, Mass., died at his home there on Dec. 24. At the age of 10 years he started to learn the cutlery trade. In 1880 he became a member of the firm of E. S. Nurlburt Co., Bernardston, Mass., and 12 years later he returned to Greenfield

with his brother, the late J. Henry Nichols, and purchased the Greenfield Tool Co. In 1902 he started making threading tools in another plant, and in 1905 consolidated the two companies under the name of the American Tap & Die Corp.

FRANCIS TINKER, president of the F. Tinker & Sons Co., Pittsburgh, cutlery manufacturer, died on Dec. 26, aged 90 years. He was born in Thurlton, Yorkshire, England, and came to the United States in 1860 where he located in Pittsburgh. He began the

manufacture of steel shear knives in 1883 as a partner in the firm of Samuel Trethewey & Co., Ltd., continuing in that capacity until 1916, when the company was incorporated as the F. Tinker & Sons Co. He had served as president since that time.

WALTER F. BAKER, president, Charles F. Baker & Co., Boston, nail manufacturer, died suddenly on Dec. 26. He was born in Franklin, Mass., 41 years ago, and was a graduate of Harvard University. He became president of the nail concern in 1911.

## Railroad Buying Expected

Consolidation Plan Believed to be Forerunner of New Developments

WASHINGTON, Jan. 6.—The proposed consolidation of railroads east of the Mississippi river and north of the Ohio and Potomac rivers, excepting those in New England, is expected to develop important requirements for iron and steel. The mergers, which would constitute four independent systems, according to a statement by President Hoover, are not expected to be actually completed, before some time in 1932. Rail executives, however, evidently are hopeful that plans will be given quick attention by the Interstate Commerce Commission, which under the Transportation Act is required to approve or disapprove them.

The grouping of the railroads will undoubtedly mean the purchase of material to build up the weaker lines and also to connect and improve the new systems. The President's statement pointed out that "such questions as electrification, linking up of different railroads, development of terminals and other major improvements have been retarded because of uncertainty with respect to the position which particular roads are to occupy in the permanent grouping."

Although he has been criticised by Senator Couzens, chairman of the Committee on Interstate Commerce, and other members of Congress, for initiating negotiations to bring about consolidation of the railroads, the action of President Hoover has met with general public approval. Efforts made previously have proved unsuccessful, and it is the opinion of the President that consolidation at this particular time would be a "contribution to the recovery of business by enlarging opportunity for employment and by increasing the financial stability of all the railways, and particularly some of the weaker roads."

It was pointed out by the President that the Transportation Act of 1920

"provides for a consolidation of railways into a limited number of strong systems in order to maintain broader competition, more adequate service, simplification of rate structure, lower operating costs and in the long run lower rates to the public." Uncertainties and delays in effecting consolidation were declared to have seriously retarded development of the carriers, prevented a desirable growth in many directions and diminished their ability to compete with other forms of transportation.

The prospective lower rates apparently indicate reductions will be made to meet water and motor truck and motor bus competition which has been the object of serious complaint by the carriers.

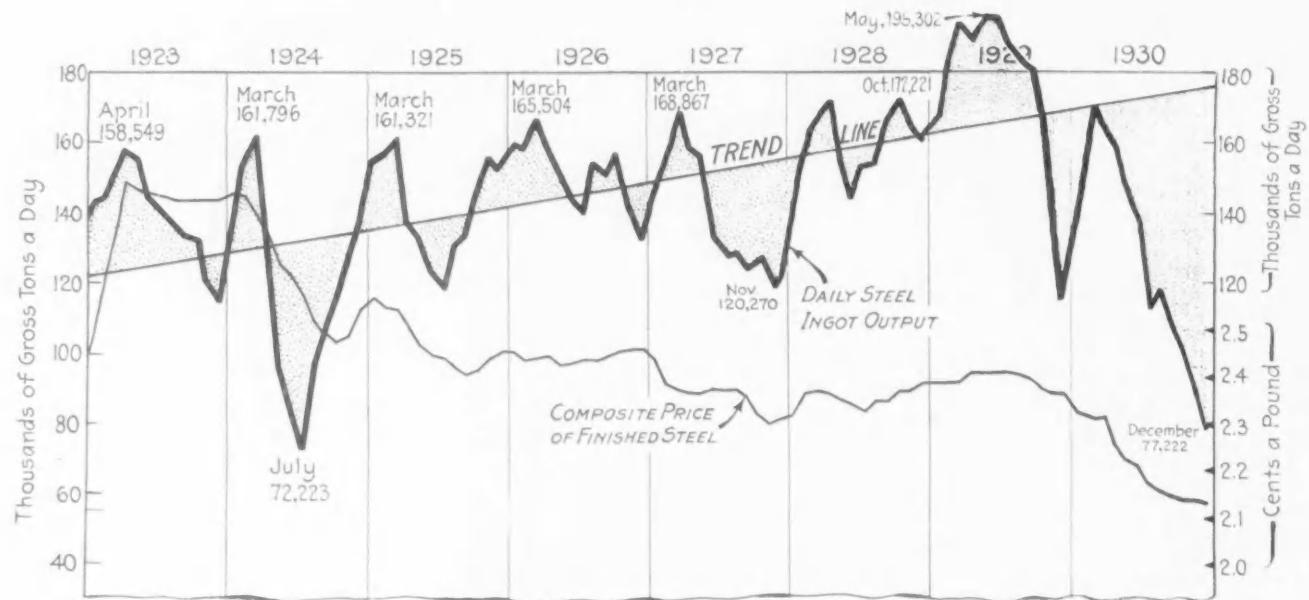
### Ohio Steel Foundry Co. Sponsors Research Project

Battelle Memorial Institute, Columbus, Ohio, announces the establishment at the institute of a research project sponsored by Ohio Steel Foundry Co., Lima and Springfield, Ohio.

This research project will consist of a comprehensive study of steel foundry practice with a view to developing improvements and economies in practice as well as the betterment of finished products. Dr. C. H. Lorig, a member of the institute staff and a specialist in foundry practice, will be in immediate charge of this work under the direction of Clyde E. Williams, assistant director.

Two years without a single lost-time accident is the safety record of the Hanover quarry of the Bethlehem Steel Corp. In the two preceding years there were 10 lost-time accidents, including one fatality.

Ingot output in December continued the downward movement, briefly interrupted in August. Prices in December made a slightly lower level



## Ingot Output Drops Further at Year-End

PRODUCTION of open-hearth and Bessemer steel ingots in the United States in December is reported by the American Iron and Steel Institute at 2,007,774 gross tons. This represents a drop of 10 per cent from the November production, which in turn was 18 per cent below that for October. Thus, the

downward movement, which has been in progress since early spring and interrupted only by the slight spurt in August, has continued further.

We are making only 69 per cent as much steel as a year ago, when December showed a total of 2,903,012 tons. Last month's output is the lowest for any month since July, 1924.

On the daily average basis, production dropped in December to 77,222 tons—again the lowest level since July, 1924, and only the second month since that year which has fallen below 100,000 tons. The drop from November, on the daily basis, was 13.6 per cent.

Compared with the maximum daily figure for many months, which was that of June, 1929, with 196,118 tons, last month's output represented a little over 39 per cent.

### Year's Total About 40,000,000 Tons

For the 12 months of the year the total is calculated at 39,652,539 tons, the average daily rate having been 127,500 tons. Comparing this with the average daily rate for 1929, which was 174,638 tons, a decline of 27 per cent has been registered.

Electric and crucible ingots are not included in these figures, nor have they been included since 1926. Last year they represented about 1 per cent of the total tonnage and averaged some 1725 tons to the working day. Adding these in, the year's total may slightly exceed 40,000,000 tons.

Compared with November, Bessemer tonnage sustained a heavier loss than did open-hearth tonnage, as was true also a month ago. In the case of the older process the reduction was more than 24 per cent, compared with a drop of less than 8 per cent for open-hearth tonnage. Both, however, made new low figures for the year and the lowest totals they have had in several years.

PRODUCTION OF OPEN-HEARTH AND BESSEMER STEEL INGOTS (Gross Tons)

	Reported by Companies Which Made 94.27 Per Cent of the 1929 Ingots		Calculated Output of All Companies		No. of Working Days
	Open-Hearth	Bessemer	Monthly	Daily	
Total, 1928	40,538,657	6,591,217	49,865,185	160,338	311
1929					
January	3,692,062	549,616	4,500,131	166,672	27
February	3,590,826	489,279	4,328,713	180,363	24
March	4,180,468	596,691	5,068,176	194,930	26
April	4,025,409	640,351	4,950,553	190,387	26
May	4,275,161	707,484	5,286,246	195,787	27
June	3,999,363	622,004	4,902,955	196,118	25
6 months	23,763,229	3,605,425	29,036,274	187,331	155
July	3,922,053	649,550	4,850,583	186,561	26
August	3,987,400	668,023	4,939,086	182,929	27
September	3,624,954	642,886	4,527,887	181,115	25
October	3,631,674	642,235	4,534,326	167,939	27
November	2,796,214	522,672	3,521,111	135,427	26
December	2,375,797	360,489	2,903,012	116,120	25
Total, 1929	14,101,321	7,091,680	54,312,279	174,639	311
1930					
January	3,137,602	441,572	3,796,090	140,596	27
February	3,336,921	508,618	4,078,327	169,930	24
March	3,613,904	539,616	4,299,905	165,381	26
April	3,406,610	509,234	4,153,860	159,764	26
May	3,265,190	528,968	4,024,778	149,066	27
June	2,835,527	467,586	3,440,239	137,610	25
6 months	19,494,254	2,935,594	23,793,199	153,505	155
July	2,411,592	353,723	2,933,399	112,823	26
August	2,543,466	374,467	3,095,293	119,050	26
September	2,273,668	429,975	2,867,978	110,307	26
October	2,164,830	399,704	2,729,414	100,756	27
November	1,806,109	360,337	2,234,482	89,379	25
December	1,665,875	226,854	2,007,774	77,222	26
Total, 1930	32,359,794	5,020,654	39,652,539	127,500	311

# Steel Value Over 3 Billion

1929 Output Estimated by Bureau of Census  
at \$3,350,574,340

WASHINGTON, Jan. 6.—The steel works and rolling mill industry of the United States in 1929 manufactured products to the value of \$3,350,574,340, based on f.o.b. plant prices, according to the Bureau of the Census. This total is an increase of 20.7 per cent, compared with \$2,776,385,255 reported for 1927. The number of reporting plants in 1929 was 485, a decrease of one from the number reporting in 1927. The report covers both establishments which manufacture from the raw products to the finished steel and those which produce no further than semi-finished material.

The total tonnage of steel ingots produced in 1929 by all the plants is given as 56,158,413 gross tons, a record in the history of the industry and an increase of 25.5 per cent when compared with the 44,756,716 tons reported for 1927. In addition, it is pointed out, 63,046 tons of steel castings, both those consumed by the producer and those sold, was reported by foundries classified in the "Foundry and Machine Shop Products" industry. No data are available on castings produced and consumed in works by establishments classified in other industries.

The output for sale and interplant transfer of finished rolled and forged products of steel works and rolling mills in 1929 amounted to 30,487,938 tons, valued at \$1,600,651,326, compared with 23,738,478 tons, valued at \$1,251,788,161, for 1927. In addition, 9,501,441 tons of finished rolled and forged products was produced and consumed in further manufacture in the same works.

## Products Classified

The more important classes of these products manufactured for sale and interplant transfer were as follows: Steel bars, 6,228,174 tons, valued at \$358,600,810; iron bars, 187,076 tons, \$13,282,853; concrete reinforcing bars, 972,053 tons, \$42,416,829; automobile body sheets, 1,227,262 tons, \$113,813,600; plain sheets, 2,670,587 tons, \$182,943,506; plates, including crucible or saw plates, 5,214,818 tons, \$226,581,253; hot-rolled strips for cold rolling, 414,036 tons, \$17,274,894; other strips and hoops and bands, 1,527,802 tons, \$73,784,237; plain structural shapes, 4,674,451 tons, \$188,897,691; rails, 2,666,208 tons, \$113,824,509; skelp, 1,271,355 tons, \$50,121,196; wire rods, 1,155,182 tons, \$49,042,098.

The value of further manufactured products made in departments of steel works and rolling mills from finished rolling mill and foundry products amounted to \$1,075,323,238. The more

important of these products were tin plate and terne plate and wire and wire products, on which reports have been issued; wrought pipe and tubes; bolts and nuts; galvanized plates and sheets; corrugated sheets; fabricated structural steel; switches, frogs and crossings; horseshoes; railroad spikes; cold-rolled strip steel and iron castings.

Statistics showing the entire production of these commodities made both in rolling mills and in other establishments will be published in the final report of the present census.

## Plate Fabrication Orders Gained in November

WASHINGTON, Jan. 6.—Making an increase of 2135 tons, orders placed last November for fabricated steel plate totaled 26,137 net tons, against 24,002 tons in October, according to reports received by the Bureau of the Census from 48 firms. The November orders were distributed as follows: Oil storage tanks, 9401 tons; refinery materials and equipment, 1392 tons; tank cars, 267 tons; gas holders, 5267 tons; blast furnaces, 179 tons, and miscellaneous, 9631 tons.

In the first 11 months of 1930, orders totaled 365,985 tons, against 489,530 tons in the corresponding period of 1929. The orders in the first 11 months of last year were distributed as follows: Oil storage tanks, 96,558 tons; refinery materials and equipment, 43,043 tons; tank cars, 32,354 tons; gas holders, 29,860 tons; blast furnaces, 7056 tons, and miscellaneous, 157,114 tons.

## Engineers to Study Facts of Unemployment

Answering the call of Col. Arthur Woods, chairman of President Hoover's emergency employment committee, for aid in the present crisis, the engineering profession of the country, through the American Engineering Council, has undertaken to disclose the facts of unemployment and of relief effort, temporary and permanent, throughout American industry.

"Regularization" of industry will be the keynote of the investigation, which will be directed by a committee of the American Society of Mechanical Engineers, with Ralph E. Flanders, manager, Jones & Lamson Machine Co., Springfield, Vt., and vice-president of the society, as chairman.

Other members are: Dexter S. Kimball, dean of the college of en-

gineering, Cornell University, and a past president both of the engineering council and of the society; Ely C. Hutchinson, New York, editor of *Power*, and a manager of the society; J. W. Roe, professor of industrial engineering, New York University; Col. C. H. Crawford, contracting engineer, New York, and Col. W. A. Starrett, vice-president of Starrett Brothers & Eken, Inc., New York. Ex-officio members are the president of the society, Roy V. Wright, editor of *Railway Age*, and Calvin W. Rice, secretary of the society.

More than 100 subcommittees, representing local sections of the A. S. M. E. and the American Institute of Electrical Engineers, will be appointed. Information gathered will be turned over to the engineering council for submission to Colonel Woods.

The expressed desire of Colonel Woods is that "American engineers contribute throughout industry to the adoption of policies which will make for better dealing with unemployment this winter and for an enlightened attack on this problem on the part of the management of our whole economic organization."

## Bar and Tin Mill Workers' Wage Rates Reduced

Tonnage rates for boilers, muck mill hands and finishers in Midwestern bar mills decline for January-February, following bi-monthly examination of sales sheets revealing average selling price of \$1.70 a 100 lb. on bar iron shipments for 60 days ended Dec. 20. This compares with an average of \$1.80 two months before. For the next two months the puddling rate will be \$10.30 a ton, against \$10.80 the past four months and \$11.80 in January-February, 1930.

For January-February the tonnage rates paid to sheet and tin mill workers will decline to 16.5 per cent above base from 18 per cent, where they have been pegged for four months. The decline follows a drop in the average selling price of Nos. 26, 27 and 28 gage black sheets shipped during the past 60 days to \$2.70 a 100 lb. from \$2.75, the average two months ago.

New rates are the lowest in several years, and were established at the bi-monthly conferences between manufacturers and representatives of workers.

A. H. Cohn & Sons and Charles Horewitz, Butler, Pa., old material dealers, have consolidated their business interests under the name of the Butler Iron & Steel Co., with offices at 201 Kittanning Street, Butler, Pa. The new company will maintain yards on Negley Avenue, East Cunningham Street and Kittanning Street in Butler. Harry M. Cohn is president of the organization, Charles Horewitz is treasurer, and Louis S. Cohn is secretary.

## Steel Castings Orders Up Slightly in November

WASHINGTON, Jan. 6.—Orders for steel castings in November, 1930, totaled 47,862 net tons, representing 33 per cent of the capacity of the manufacturers reporting to the Bureau of the Census, and compare with 45,552 tons, or 32 per cent of capacity, reported for October. Production in November was 44,303 tons, or 31 per cent of capacity, against 59,522 tons, or 41 per cent of capacity, in the preceding month. In the first 11 months of 1930 orders aggregated 836,519 tons, or 53 per cent of capacity, compared with 1,249,747 tons, or 78 per cent of capacity, in the corresponding period of 1929. Production in the first 11 months of 1930 totaled 947,434 tons, or 60 per cent of capacity, against 1,249,062 tons, or 78 per cent of capacity, in the first 11 months of 1929.

Orders last November consisted of 16,495 tons of railroad specialties and 31,367 tons of miscellaneous castings. Production included 11,845 tons of railroad specialties and 32,458 tons of miscellaneous castings. For the first 11 months of 1930, orders were comprised of 313,943 tons of railroad specialties and 522,576 tons of miscellaneous castings, comparing with 563,919 tons and 685,823 tons, respectively, for the corresponding period of 1929.

## Road Machinery Exports Continue to Gain

Reflecting the general progress which the world is making in improved highway building, exports of road building machinery from the United States during the first 10 months of 1930 continued the steady growth of past years by exceeding the total for the corresponding period of 1929, according to the Industrial Machinery Division, Department of Commerce.

Exports for the 10-month period of 1930 were valued at \$2,973,000, compared with \$2,849,000 for the similar period of 1929. The values for the separate classes entering into this trade were as follows: 1929 period, road rollers \$273,000, road graders \$801,000, other road making equipment \$1,774,000; 1930 period, road rollers \$294,000, road graders \$968,000, other road making equipment \$1,711,000.

Canada has been the largest and most rapidly growing outlet for United States road-making machinery. Canada's lead was greatly increased in 1928, when it purchased equipment valued at more than double that of the next largest market. In 1929 the Canadian purchases reached abnormal volume, valued at more than six times that of Argentina, the next most important customer. This unusual demand is not so surprising when it is noted that expenditures by Canadian provinces

in 1929 for highway construction and maintenance (including bridges) totaled \$76,283,000. Of this amount \$55,173,000 was spent for the construction of 12,152.5 miles of highway and \$21,110,000 for maintenance. No money was spent on highways by the Dominion Government during 1929.

Argentina which is one of the few important Latin American countries that have not as yet established a definite road-building program, leads South America in purchases of road machinery. With less than 500 miles of first class hard-surfaced automobile roads, Argentina leads all Latin America in automobile registration.

## Fabricated Steel Orders Off Sharply in November

WASHINGTON, Jan. 6.—Bookings of fabricated structural steel in November totaled 130,644 net tons, according to reports received by the Bureau of the Census from 209 establishments with 332,239 tons monthly capacity, or 83.1 of the estimated total capacity of 400,000 tons. Actual bookings reported for October by 211 establishments aggregated 182,449 tons. Shipments reported for November by 203 establishments were 136,659 tons. These latter establishments have a capacity of 264,177 tons or 66 per cent of the total.

Computed bookings for November were 157,200 tons, or 39.3 per cent of capacity, against 219,600 tons, or 54.9 per cent of capacity, in October. Estimated shipments were 206,800 tons, or 51.7 per cent of capacity, compared with 253,600 tons, or 63.4 per cent of capacity.

## Steel Furniture and Shelving Orders Off

WASHINGTON, Jan. 6.—Orders for steel furniture stock goods in the business group were valued at \$1,636,785 last November, against \$1,854,679 in October, according to reports received by the Bureau of the Census from 34 manufacturers. Shipments were valued at \$1,672,518 and \$1,900,865 respectively. Unfilled orders at the end of November were valued at \$1,167,535, compared with \$1,203,268 at the end of October. In the first 11 months of 1930, orders were valued at \$23,639,503, against \$31,453,319 in the corresponding period of 1929, while shipments were valued at \$24,354,201 and \$31,316,998 respectively.

Orders for shelving furniture reported by 16 producers were valued at \$428,599 last November, against \$534,191 in October. Shipments were valued at \$457,659 and \$592,654 respectively, while unfilled orders were valued at \$632,098 and \$661,158 respectively. In the first 11 months of 1930, orders were valued at \$7,140,175, compared with \$10,818,885 in the corresponding period of 1929.

## Locomotive Shipments Down in November

WASHINGTON, Jan. 6.—Shipments of railroad locomotives last November totaled 43 units, all for domestic use, of which 37 were steam and six were electric locomotives. October shipments consisted of 50 locomotives, 48 steam and two electric. Unfilled orders at the end of November totaled 93 locomotives, of which 64 were steam and 29 were electric units, with 63 steam and 25 electric, respectively, for domestic use.

Total shipments in the first 11 months of 1930 were 714 locomotives, of which 685 were steam and 29 electric. Of these 669 steam and 26 electric were for domestic use. Shipments in the first 11 months of 1929 totaled 779 locomotives, of which 745 were steam and 34 were electric. Of these 645 steam locomotives and all the electric units were for domestic use.

## Lukens Rolls Largest and Heaviest Plate

On its 206-in. four-high reversing type plate mill, the largest plate mill in the world, the Lukens Steel Co., Coatesville, Pa., recently produced what was said to be the largest and heaviest steel plate ever rolled.

The plate was reduced from a carbon steel ingot weighing approximately 92,130 lb. The sheared dimensions of the plate were 195 in. wide, 360 $\frac{1}{4}$  in. long and 2 $\frac{1}{2}$  in. thick. It weighed approximately 48,200 lb.

Rolling mill operations were in charge of R. W. Simpson, superintendent of mills, supervised by J. H. McElhinney and W. H. Warren, respectively general superintendent and vice-president and general manager of the Lukens company.

## Use of Coking Coal Off One-Fourth in Year

WASHINGTON, Jan. 2.—Consumption of coking coal at by-product plants in November totaled 4,558,349 net tons, a decrease of 1,683,114 tons or 27 per cent from the November, 1929, consumption of 6,241,463 tons, according to the Bureau of Mines. With the exception of New England, where a gain of 28.6 per cent took place, due largely to the installation of three new batteries of ovens, each of the consuming regions showed a lower rate of consumption. The greatest decrease was reported by plants operating in Ohio, where consumption was 40 per cent less than in November, 1929.

Pennsylvania Engineering Works, New Castle, Pa., is making final shipment of three converters for the Jones & Laughlin Steel Corp., South Side Works, Pittsburgh.

# Machine Tools "On Time"

Bullard Co., Bridgeport, Conn., Announces Inauguration of Deferred Payment Plan

THE Bullard Co., Bridgeport, Conn., has announced a deferred payment plan for machine tools, effective at once. The selling of machine tools on time payments has been much discussed in the past year or two at meetings of the National Machine Tool Builders' Association and elsewhere. Some companies have made such sales, but have limited them to a comparatively small proportion of their customers. The Bullard plan was adopted after the company had made a thorough general study of the purchase, use and earnings of modern machine tool equipment over previous and obsolete types of equipment.

In a statement accompanying the announcement, the company says:

"It is recognized that in the general opinion of the industry two years is the accepted period for such earnings to justify the cost of the change, and, by varying this under the conditions existing in the individual case, an equitable division of earnings forms an essential part of the plan.

"Primarily, the returns effected by new equipment are in relation not only to the performance of the machinery installed, but also in relation to the volume of production required by the business at hand and anticipated during the period of deferment, so that a rational figure of agreement may be set arbitrarily as an approximation of reasonable payments both in size and in time.

## Plan Offers Flexibility

"The plan includes a first payment of sufficient size to assure protection to the company and to represent an avowed intention on the part of the purchaser. Under the varying conditions that may be encountered, the plan includes a flexibility sufficient to cover the extreme cases. In such instances individual installations have been known to justify the investment by the earnings made within a few months, and in other cases where machines have been purchased as a mechanical device essential to the method required by the work, yet offering only limited savings, sufficient earnings on the volume of work would be accumulated only over a period of several years. However, both extremes may be represented in the period of deferment and the actual economy worked out in each case on the basis of cost.

"In approaching such negotiations, the company offers for consideration its standard equipment and a study of the work involved, so that future earnings may be approximated. On the other hand, the customer offers for consideration not only the work

for which the machine is intended, but an approximate volume indicating how much may be expected from his position in the industry and his market during the period of time required for payment.

"The Bullard Co. does not present this plan so much from an attitude of 'selling,' in an attempt to force its equipment on to the market, but from an attitude of offering a plan whereby such industries as deserve the benefit may be assisted in alleviating the present conditions of obsolescence in metal-working equipment.

"The turning current in the cycle of business at the present time furnishes particularly favorable conditions under which to inaugurate such a policy."

## Standard for Machine Pins Circulated for Review

The proposed standard for machine pins of the cylindrical and taper types, prepared by a technical committee of the American Standards Association, is now being circulated for review and criticism. The committee which developed the standard is under the joint sponsorship of the American Society of Mechanical Engineers and the Society of Automotive Engineers.

The draft proposal covers a diameter range of taper pins from  $1/16$  to  $1\frac{1}{2}$  in. and a length range of  $\frac{1}{2}$  to 12 in. The number of keys stocked has been reduced from 173 to 143. An effort has been made to eliminate the objectionable features in the present non-standard systems, thus relieving industry of the burden involved in replacements and interchangeability of the pins, and also of drills and reamers.

## Small Diameter Basis of Taper Pin Size

The proposed standard retains the present taper of  $\frac{1}{4}$  in. per ft. of length and designates the size of pin from the diameter of its smaller end. The smaller diameter of the pins is in the usual fractional dimensions, spaced by thirty-seconds from  $1/16$  to  $3/16$  in. diameter, by sixteenths to  $\frac{3}{8}$  in. diameter, by eighths to  $\frac{1}{4}$  in. diameter, and by quarters to  $1\frac{1}{2}$  in. diameter. The number of diameters is reduced from 20 to 14. Ends of the pins have been rounded to facilitate driving, to lessen the possibility of cutting, to prevent deformation of the side bearing surface, and to make it unnecessary to drive the pins to

such an exact location in their places as pins with sharp, distinct edges. Objectionable features eliminated or minimized include the arbitrary numerical symbolization which has no direct mathematical relation to the actual size of the pin and the irregular progression from one size of pin to another.

In the general discussion accompanying the proposal it is also stated that "another objectionable feature, though not dealing with pins directly, is the lack of coherent relationship between the pins and reamers. A study of the related dimensions of the pins and reamers and, in particular, the overlap of a reamer beyond both ends of taper pins of maximum length shows that present conditions leave much to be desired. There is a lack of uniform progression between the various sizes of reamers and in two cases the small end of the reamer is larger than the small end of a pin of maximum length. Furthermore, an agreement between various manufacturers is also lacking."

The proposed American standard for cylindrical pins is intended to cover the requirements of machine pins used as rod-end pins, pivots, dowels, journals, idler pins, locating pins, cam roller pins, short axles, and others, which are not standardized to any extent in this country and, generally speaking, are not presented as commercial articles.

Copies of the proposed standard may be obtained from the American Standards Association, 29 West Thirty-ninth Street, New York.

## Personnel Conference at Niagara Falls

"What's Ahead in Personnel Administration in the Light of 10 Years' Experience?" will be the major topic of the annual personnel conference to be held by the American Management Association at the Hotel Niagara, Niagara Falls, N. Y., Feb. 2 and 3.

The meeting will include round table discussion (Feb. 3) of a paper on "Methods of Minimizing the Effective Business Depression on the Working Forces." This will be followed by simultaneous symposiums on the following topics: "Employee Training and Education: Supervisory training, apprentice training, foreman training, and training on the job;" "Thrift, Savings, Pensions, Group Insurance, Benefits, Loans and Stock Subscriptions;" "Hours, Vacations, the Working Week;" "Individual Differences and Adjustments: Selection, performance, tests, interviewing, recruiting, mental hygiene;" and "Group Relationships: Employees' representation, union-management, cooperation."

Plant visitations and two dinner meetings also feature the program.

## Slow Pick-Up In Machine Tool Sales Expected

BASED on their views on past experience in machine tool trends, the sellers of metal-working equipment do not look for any marked rise in sales until a fairly good recovery in general business has developed. Nevertheless, January may bring a fair gain over the abnormally low totals of the last several months of 1930.

Following the inactive holiday period, inquiries have been more

numerous in some districts, but there is still a reluctance in placing orders, which probably will not be removed until signs of business gains are more prevalent.

A fairly large amount of business is in prospect, and this may be augmented by inventory taking, which has brought a thorough going-over of equipment in some plants with a view to determining what machines have outlived their usefulness and should

Trade Not Looking for  
Important Resumption of Buying  
Until General Business Improves

be replaced by modern tools. It is a question, however, as to how soon some of this business may develop into orders.

A plan of deferred-payment selling of machine tools, used heretofore only in isolated instances by most tool builders, has been announced by the Bullard Co., Bridgeport, Conn., and is expected to be a factor of some importance in the development of sales policies by other machine tool builders.

### New York

Machine tool sellers in this district take a slightly more hopeful but moderate view of the outlook for the first quarter. Notwithstanding that there was a little quickening in demand following the holidays, it is not believed that there will be an appreciable improvement in sales immediately. From long experience with the ups and downs of machine tool business, the trade realizes that a normal volume of machinery sales is not likely to develop until there has been a fairly broad recovery in the many lines of industry that are the users of metal-working equipment.

An announcement, published elsewhere in this issue, that the Bullard Co., Bridgeport, Conn., has adopted a policy of deferred-payment selling of its machine tools is expected to stir wide discussion and interest among both buyers and sellers of tools. The plan, if adopted quite generally in machine tool sales, might, it is contended by some, be the means of stimulating orders from those manufacturers who would welcome an opportunity to pay for machine tools out of the earnings of the machines themselves, and in this way the earnings value of machine tools, rather than their original cost, would have a favorable presentation.

### Chicago

Machine tool dealers are not looking for much improvement in business during the first month or two of the new year. A fair volume of inquiry has been carried over from the old year, but it is inactive. A sprinkling of fresh inquiries has come out in the past few days, but the total number

is not indicative of a drift to betterment by the market as a whole.

Sellers, when making comparisons, prefer not to gage the whole of 1930 by any previous year. They prefer to take the last half of 1930, which was quiet, and compare that period with the dull months of 1921, the two periods being somewhat similar except as to inventories, which now are only about 25 per cent of those in 1921.

Among new inquiries is a double end axle lathe for the Burlington Railroad and old business likely to come up this month is the list for the Illinois Steel Co. The Milwaukee Board of Education is asking for two sensitive drills, two 21-in. floor drills, 14 bench drills, a bench grinder, two floor grinders, two 9-in. x 4 1/2-ft., two 11-in. x 5 1/2-ft., and two 13-in. x 6-ft. engine lathes.

### Pittsburgh

Scarcely any activity was apparent in the machinery trade the past two weeks of the year, but local dealers expect improved buying this month. The Westinghouse Electric & Mfg. Co., East Pittsburgh, placed a few tools late in December, but has not come out with a list for 1931. Other large industrial buyers in the district are making few purchases, but most of them are expected to come into the market if business shows definite improvement in January and February.

Builders of steel mill equipment and machinery are entering the new year with a fair volume of work, although unfilled orders compare unfavorably with those of a year ago. A Cleveland steel company has placed orders for a continuous sheet mill with a Pittsburgh district maker and

another steel interest in the Chicago district recently ordered a strip mill from a Pittsburgh company. Some other large orders are in prospect and electrification work in several mills promises business for makers of electrical equipment.

### Milwaukee

The new year is too young to permit a proper analysis of trends in the machine tool market, and little was done during the holidays in building up order books. December developed moderately active inquiry, and local shops confidently expect that action should follow within the next few weeks.

### Cincinnati

Basing opinions upon the present small volume of orders, machine tool builders in this district expect no definite improvement in buying before the end of this month. Most of the local plants were closed during the holidays and have just resumed production. Operations, however, are low, in keeping with the sparseness of bookings. Inquiries continue to indicate interest of buyers, but reluctance to close until general conditions clear is still evident.

The Amtorg Trading Corp., New York, has bought two medium-sized lathes and the General Electric Co. has purchased one.

### Cleveland

With the start of the new year the machinery trade is expecting a moderate and slow increase in business over the last few months of 1930, although little change for the better is looked for in January. Dealers re-

port a fair amount of business in prospect, mostly in tools for replacement. Quite a few metal-working plants have been going over their equipment with a view of determining what machines have outlived their usefulness and should be replaced by more modern tools. However, these plants are showing no disposition to purchase new machinery until business conditions improve. Sales the past week were limited to a few single machines. One local machine tool builder finds encouragement in the fact that his December sales showed a slight gain over November. Purchases by the automotive industry during the next few months are expected to be light and the outlook for business from the railroads in this territory is not promising.

#### New England

With most metal-working plants engaged in inventory taking, there was little machine tool business the past week and the market virtually is at a standstill. Sentiment among dealers is that good orders for tools will be placed this month.

#### New York

**C**ONTRACT has been let by Crane Co., 836 South Michigan Avenue, Chicago, to James Stewart & Co., 230 Park Avenue, New York, for a three-story and basement factory branch, stor-

age and distributing plant, 170 x 175 ft., with pipe and mechanical shop, at Long Island City, to cost close to \$300,000 with equipment. Voorhees, Gmelin & Walker, 101 Park Avenue, New York, are architects.

Corn Products Refining Co., 17 Battery Place, New York, is planning new corn sugar refinery at Pekin, Ill., including power house, machine shop and other mechanical structures, to cost over \$2,000,000 with equipment. Company will also carry out expansion at refinery at Kansas City, Mo., to cost more than \$500,000 with equipment.

Board of Directors, Kings County Hospital, 451 Clarkson Street, Brooklyn, has plans for mechanical division at institution, including shop unit and automobile service, repair and garage building, to cost over \$300,000 with equipment. LeRoy P. Ward, Inc., 205 East Forty-second Street, New York, is architect.

City Council, Long Beach, L. I., James J. McCabe, city clerk, is asking bids until Jan. 13 for construction of two tanks, each 750,000 gal. capacity, for municipal water system.

Department of Correction, Albany, N. Y., has plans for a new power house at proposed prison on Riker's Island, New York. Entire project will cost over \$6,000,000. State Commissioner of Architecture, State Office Building, Albany, is architect in charge.

Curtiss-Wright Airports Corp., 27 West Fifty-seventh Street, New York, is considering new airport at Secaucus, N. J., including hangars, repair shop, automobile service and garage buildings, seaplane hangars and other units, to cost more than \$1,000,000 with equipment. Kenneth Franzheim, 245 Madison Avenue,

is architect. Stone & Webster, Inc., 120 Broadway, is supervising engineer.

State Department of Correction, Albany, N. Y., is asking bids until Jan. 20, for new industrial shop, storage and distributing building at State Institution for Defective Delinquents, Napanoch, N. Y., to cost over \$150,000 with equipment. Plans at office of State Commissioner of Architecture, State Office Building, Albany.

Johnson & Nelson Mfg. Co., Brooklyn, has been organized to take over and expand company of same name with plant at 473 Liberty Avenue, Brooklyn, manufacturer of machinery and parts, metal specialties, etc. New company is headed by Swen Johnson and Helge Nelson.

Board of Trustees, Sea View Hospital, Manor Road, Dongan Hills, Staten Island, has plans for an automobile service, repair and garage building, to cost about \$100,000 with equipment. Sibley & Fetherstone, 205 East Forty-second Street, New York, are architects.

Port of New York Authority, 75 West Street, New York, has taken bids on general contract for multi-story inland freight building for storage and distribution, with industrial section, on block bounded by Eighth and Ninth Avenues, Fifteenth and Sixteenth Streets, to cost about \$15,000,000 with equipment. Engineering department is in charge.

Commissioner of Mental Hygiene, State Office Building, Albany, N. Y., will receive bids Jan. 14 for additional power plant equipment for Brooklyn State Hospital, Creedmoor Division, Queens, L. I., as per plans at office of Commissioner of Architecture, address noted, and office at 80 Centre Street, New York.

### Industrial Construction

#### Holiday Season Reduces Weekly Average but Utility Projects Increase

**T**HE holiday season had its expected effect in reducing the weekly commitments for new projects requiring machinery and industrial equipment. The total of the specific commitments for the week is \$17,469,000, compared with a weekly average, during December, 1930, of \$29,500,000.

On the other hand, there was a substantial increase in the appropriations for large public utility and other projects which will extend through 1931. The total of these for the week is \$185,000,000, compared with \$60,100,000 for the third week in December.

Classification of current projects for the week is as follows:

Public utilities and power plants	\$2,499,000
Industrial plants	8,290,000
Metal-working plants	1,890,000
Railroad construction, terminals, etc	2,050,000
Municipal improvements, airports, etc	2,740,000
<b>Total</b>	<b>\$17,469,000</b>

Not included in the total are the authorizations for extended projects amounting to \$185,000,000 and construction and equipment of schools totaling \$4,430,000.

Among the items composing industrial plant construction and equipment are a power house, machine shop and other mechanical structures to be erected by the Corn Products Refining Co. at Pekin, Ill., at an estimated cost of \$2,000,000, and a yeast manufacturing plant to be built for the Anheuser-Busch Co. at Old Bridge, N. J., at a cost of \$1,500,000.

Among the airport improvements, the Curtiss-Wright Co. is planning a new airport at Secaucus, N. J., to cost \$1,000,000 with equipment.

The Hoover Dam project, to cost \$100,000,000 is the largest of the week's extending construction programs, but is seconded by the fund of \$31,227,000 authorized by United Gas Improvement Co. for expansion and improvements of its properties during 1931.

Anheuser-Busch, Inc., 721 Pesticozzi Street, St. Louis, manufacturer of beverages, yeast, etc., has awarded general contract to Stone & Webster Engineering Corporation, 120 Broadway, New York, for five-story yeast-manufacturing plant at Old Bridge, N. J., with boiler plant, machine shop, blower house and other units, to cost about \$1,500,000 with machinery.

Frederic V. Griesman, 100 Manning Boulevard, Albany, N. Y., and associates have organized Albany Malleable Castings Corp., and plan operation of foundry at Voorheesville, near Albany, for production of malleable iron and other castings. Clifford E. Insley, 27 Woodlawn Avenue, Albany, is interested in new company.

Board of Education, Irvington, N. J., is considering installation of manual training equipment in new three-story and basement junior high school, for which bids will soon be asked on general contract, to cost \$400,000. Victor H. Strombach, 1243 Springfield Avenue, Irvington, is architect.

Jersey Central Power & Light Co., 29 South Street, Asbury Park, N. J., has begun an expansion program near Red Bank, N. J., including extensions in power station, steel tower transmission lines and distributing system, to cost \$400,000. T. D. Moore is division manager at Red Bank.

William S. Roe, Inc., 15 River Street, Newark, machinery and hardware, has engaged Epple & Kahrs, American Insurance Building, architects, to prepare plans for alterations in former factory of J. S. Crane Carriage & Hardware Co., 165-71 Mulberry Street, recently acquired. Company will remove to new location later and carry out expansion.

T. A. Gillespie Co., 7 Dey Street, New York, operating Domestic Stoker Co., manufacturer of automatic stokers, and East Jersey Pipe Co., Leetsdale, Pa., manufacturer of riveted steel pipe, has acquired for expansion plant of Eastman Chemical Co., Passaic Junction, N. J., consisting of 13 acres with group of one-story buildings totaling about 40,000 sq. ft. floor space. Plant will be used at present for repair, storage and distribution, manufacturing facilities to be arranged later.

## South Atlantic

FUND of about \$25,000,000 is being considered by Public Improvement Commission, City Hall, Baltimore, for expansion in municipal water supply system, including installation of power and pumping machinery for increased supply from Patapsco or Susquehanna Rivers, pipe line construction, etc. Edward G. Rost is water engineer for city.

Chevrolet Motor Corp., 3044 West Grand Boulevard, Detroit, has leased plant of American Locomotive Co., on Boulevard, Richmond, Va., for its commercial body division, and will remodel for production of motor truck bodies, including assembling and mounting departments. Plant will be ready for service late this month. Company is considering erection of body plant at Richmond later.

Board of District Commissioners, District Building, Washington, is asking bids until Jan. 15 for one 2000-lb. trolley and block and one 10,000-lb. trolley and block.

Pocahontas Fuel Co., Pocahontas, Va., has begun erection of new tipple at coal properties at Bishop, where company has tract of about 20,000 acres, to cost about

\$30,000 with equipment. Coal-mining properties will be developed and equipment installed.

Barrett Co., 43 Rector Street, New York, manufacturer of roofing products, road-building materials, etc., with main plant at Grays Ferry Avenue and Thirty-sixth Street, Philadelphia, is contemplating branch plant on property of Rockydale Stone Co., near Roanoke, Va., to cost about \$40,000 with equipment.

Superintendent of Lighthouses, Fifth District, Baltimore, is asking bids until Jan. 12 for watertube boilers and oil-burning equipment for marine service, as per specifications on file.

Clark Thread Co., 2600 Ogden Street, Newark, N. J., plans construction of a power house, machine shop and other units in connection with new mill on 1000-acre tract at Austell, about 17 miles from Atlanta, Ga. Entire project will cost close to \$2,000,000 including housing development for employees. It is understood that J. E. Sirrine & Co., Greenville, S. C., architects and engineers, will prepare plans.

York River Shipbuilding Corp., West Point, Va., has placed its local plant on market, including 65 acres of waterfront property and number of buildings.

Public Improvement Commission, City Hall, Baltimore, plans installation of manual training equipment in new Southeast Junior high school, for which a fund of \$800,000 is available. Wyatt & Nolting, Keyser Building, architects, will draw plans. H. J. Leimbach, Municipal Office Building, is supervising engineer for commission.

Annapolis Water Co., Municipal Building, Annapolis, Md., is asking bids until Jan. 15 for pumping machinery. Walter C. Munroe is consulting engineer.

## Buffalo

PLANS are being arranged by Curtiss-Wright Corp., Vulcan Street and Kenmore Avenue, Buffalo, manufacturer of aircraft and parts, for concentration of production in five centers. Plant at Garden City, L. I., will be removed to Buffalo in spring and consolidated with local plant which will be given over to production of military airplanes and experimental laboratories. Engine division now at Buffalo will be removed to Wright Aeronautical Works division at Paterson, N. J., which will be given over in future exclusively to engine production and development. Commercial aircraft, including parts production and assembling, will be concentrated at Curtiss-Robertson plant at St. Louis, following change in Eastern works. Manufacture of monoplanes and biplanes will be carried out at plant at Wichita, Kan., while production of flying boats, amphibians and other air-sea craft will be concentrated at Keystone Works, Bristol, Pa.

Department of Correction, Albany, N. Y., will receive bids until Jan. 27 for new buildings at State prison at Attica, N. Y., including mechanical shop, textile shop, equipment storage and distributing building and other units, to cost close to \$1,000,000 with equipment. State Commissioner of Architecture, State Office Building, Albany, has plans and specifications.

Board of Managers, Buffalo City Hospital, 462 Grider Street, Buffalo, will receive bids until Jan. 14 for coal and ash-handling machinery, garbage and refuse

destructor, laundry machinery and other equipment for Nurses' Home building. F. J. and W. A. Kidd, 524 Franklin Street, are architects.

William J. Beckman, 61 Kirkpatrick Street, Buffalo, has organized William J. Beckman Machine Works, to operate a local machine and repair shop for parts production and other manufacture.

Lock-Rite Corp., Rochester, N. Y., which was organized by Rochester interests, has installed machinery and will soon start production of toys, novelties and household specialties. Merritt P. Whipple, who has been membership secretary of Rochester Chamber of Commerce for several years, has become president of new company.

Artisan Sheet Metal Corp. has been sold by order of United States District Court to Albert W. Jacobs, president, Star Headlight Co., Rochester, who recently acquired also Loco Light Co. of Indianapolis and merged it with Star Headlight Co. Artisan Sheet Metal Corp. was a manufacturer of stop and go signals for street traffic control.

## New England

CONTRACT has been let by Lindstrom Tool & Toy Co., Silliman Street, Bridgeport, Conn., to T. J. Pardy Construction Co., 1481 Seaview Avenue, for two-story plant, 41 x 150 ft., to cost about \$50,000 with equipment.

Androscoggin Electric Co., Lewiston, Me., has arranged for a bond issue of \$873,500, part of proceeds to be used for expansion and improvements in power stations and system. Company is controlled by Central Maine Power Co., Augusta, Me.

New England Telephone & Telegraph Co., 50 Oliver Street, Boston, is asking bids on general contract until Jan. 13 for a six and one-story equipment storage and distributing plant, with cable and tool departments, and automobile service and garage unit, at Watertown, Mass., 120 x 140 ft., and 86 x 265 ft., to cost over \$200,000 with equipment. Monks & Johnson, 99 Chauncy Street, Boston, are architects and engineers.

Turners Falls Power & Electric Co., Turners Falls, Mass., will carry out expansion at local power plant, including construction of new steel tower transmission line and power substation facilities, to cost \$500,000. Company engineering department is in charge. George W. Lawrence is president.

Board of Trustees, Massachusetts Institute of Technology, Cambridge, has filed plans for two laboratory additions, four stories, 60 x 300 ft., and two stories, 50 x 100 ft., for chemical and mechanical service, to cost about \$700,000 with equipment. Stone & Webster Engineering Corp., 49 Federal Street, Boston, will supervise construction. Coolidge & Carlson, 39 State Street, are architects; Charles T. Main, Inc., 201 Devonshire Street, is engineer.

Homer F. Marshall and Thomas A. Widdop, 260 South Street, Plainville, Mass., have organized Marshall Machine Co., Inc., with capital of \$300,000, to operate a local plant for manufacture of road machinery, including oiling, sanding and other maintenance machines. Mr. Marshall will be president and Mr. Widdop, treasurer.

Brownsville Slate Co., Brownsville, Me., is planning a one-story addition and improvements in present works, to cost

over \$40,000 with equipment. L. H. Alline, Presque Isle, Me., is in charge.

Lummus Co., a new engineering and contracting firm with authorized capital stock of \$10,000,000, has been organized to take over business of Walter E. Lummus Co., Boston. Superheater Co. and Babcock & Wilcox Co. are largely interested in new firm. Lummus Co. will engage in design and manufacture of distillation and refining equipment for alcohol, chemical and petroleum industries, thus following lines of activity of former company, but operating on larger scale. Officers of new company are: President and treasurer, Walter E. Lummus; vice-president and secretary, Raymond R. Collins.

F. X. Laliberte & Sons, Inc., Southbridge, Mass., is building a garage, machine shop and blacksmith shop, to cost \$5,500 without equipment.

Atlantic Gypsum Products Co., Free-man's Point, Portsmouth, N. H., has started work on manufacturing unit No. 6, to cost \$100,000 exclusive of equipment.

General Utilities Co., 199 Exchange Street, Bangor, Me., manufacturer of washing machines and refrigerators, contemplates erection of a new plant to cost \$100,000 without equipment.

## Philadelphia

**F**UND of \$31,227,000 has been authorized by United Gas Improvement Co., 1401 Arch Street, Philadelphia, for expansion and improvements in electric light and power and gas properties during 1931, including extensions in power plants, transmission and distributing lines. About \$18,494,860 will be used by Philadelphia Electric Co., Tenth and Chestnut Streets, and \$2,000,000 by Philadelphia Gas Works Co., 1401 Arch Street. Delaware Electric Power Co., Wilmington, Del., another subsidiary, will use a fund of \$1,723,892, and Harrisburg Gas Co., Harrisburg, Pa., \$302,382. Company engineering department will be in charge. United Gas Improvement Co. has purchased Chester Valley Electric Co., Chester, Pa., and Kennett Gas Co., Kennett, Pa., and will consolidate with properties controlled by Commonwealth Utilities Corp., a subsidiary, which will make extensions and improvements.

Autocar Co., Ardmore, Pa., manufacturer of commercial automobiles, has work under way on factory branch, service, repair and sales plant at Indiana Avenue and Thirty-fourth Street, Philadelphia, totaling 90,000 sq. ft. floor space, to cost over \$250,000 with equipment. Branch at Twenty-third and Market Streets, will be removed to new location.

Media Concrete Products Co., Brooke Street and Pennsylvania Railroad, Media, Pa., plans rebuilding of portion of plant recently destroyed by fire, with loss of over \$50,000 including equipment.

Barrett Co., Grays Ferry Avenue and Thirty-sixth Street, Philadelphia, manufacturer of roofing products, road materials, etc., has asked bids on general contract for a one-story addition, to cost over \$40,000 with equipment.

Officials of Philadelphia Storage Battery Co., Ontario and C Streets, Philadelphia, manufacturer of electric storage batteries, radio equipment, etc., have organized Transitone Automobile Radio Corp., a subsidiary, to manufacture Philco-Transitone automobile radio equipment; it will take over and succeed Au-

tomobile Radio Corp. of America, Inc. New company will occupy part of new four-story plant to be built by parent organization at Tioga and C Streets, to cost over \$150,000 with equipment. Plans are being drawn by William Steele & Sons Co., Eleventh and Cherry Streets, engineer.

Diamond Silver Co., recently organized by interests connected with Mitten Men & Management Bank & Trust Co., Market Street, Philadelphia, has acquired at receiver's sale, plant and property of Hobson Flatware Co., Lambertville, N. J., manufacturer of plated goods. New owner plans improvements, including installation of additional equipment.

Officials of Pennsylvania Power & Light Co., Allentown, Pa., have organized Pennsylvania Natural Gas Co., as an affiliated interest, and plan development and operation of natural gas properties in Potter, Tioga, Bradford, Susquehanna, Lycoming and other counties, including pipe line construction for distribution in territory now served with electric light and power by parent organization. P. B. Sawyer, Bethlehem, Pa.; John S. Wise, Jr., and C. M. Walter, Allentown, head new gas company. Parent company is operated by Electric Bond & Share Co., 2 Rector Street, New York.

Plant and equipment of Crane Iron Works, Catawissa, Pa., have been acquired by H. Sofrancy Co., Allentown, Pa., metal and used equipment dealer, and property will be dismantled at early date. Plant has been idle for several years.

## Cleveland

**C**ONTRACT has been let by B. F. Goodrich Co., Akron, Ohio, manufacturer of tires, tubes and other rubber goods, to J. C. Orr & Son, Altoona, Pa., for one and two-story factory branch, storage and service plant, 50 x 162 ft., at Altoona, to cost about \$60,000 with equipment.

Gledhill Road Machinery Co., Galion, Ohio, care of Carl J. Guler, 203 Wyandot Building, recently organized, is planning early erection of one-story plant for manufacture of road-building machinery, including parts production and assembling, to cost over \$50,000 with equipment. New company is headed by E. C. Gledhill and E. B. Beall, both of Galion.

Monda Grinding & Machine Co., 1925 East Fifty-fifth Street, Cleveland, S. M. Monda, head, has leased Brown-Graves Building, 1804 East Fifty-fifth Street, and will establish plant at that location, removing present works and increasing capacity.

Fiske Brothers Refining Co., 1500 Oakdale Avenue, Toledo, Ohio, has approved plans for enlargement in oil storage and distributing plant, to cost about \$50,000 with equipment.

Ohio Edison Co., Youngstown, will soon begin erection of steel tower transmission line from Toronto, Ohio, to East Akron, Ohio, with extensions in power substation facilities, to cost over \$400,000. Allied Engineers, Inc., Youngstown, is construction engineer for company.

Rola Co., 2570 Superior Avenue, Cleveland, manufacturer of radio loud speakers and kindred equipment, has leased additional space in building now occupied in part, totaling about 30,000 sq. ft., for expansion. Company will remove factory from Oakland, Cal., to Cleveland, and concentrate production there.

Conveying machinery and other mechanical-handling equipment will be installed in new two-story and basement plant to be built by Youngstown Sanitary Milk Co., 715 Erie Street, Youngstown, to cost over \$100,000 with equipment.

Lester Die & Machine Co., Thirtieth Street and Superior Avenue, Cleveland, has been organized by N. Lester to manufacture dies, die castings and to do die casting engineering work. Mr. Lester was formerly connected with P & R Tool Co., Worcester, and recently with Precision Castings Co., Syracuse and Cleveland. Directors include N. Lester, William Lester and F. W. McIntyre.

Franklin Tool & Die Co., Cleveland, has moved into larger quarters at Twelfth and Hamilton Avenues. Additional equipment has been installed. L. J. Zaro is president.

## Chicago

**C**ONTRACT has been let by Public Service Co. of Northern Illinois, 72 West Adams Street, Chicago, to E. C. Billings, Barrington, Ill., for equipment storage and distributing plant at Crystal Lake, Ill., including mechanical shop, automobile service and garage building and other divisions, to cost \$180,000 with equipment.

Pal-Waukee Airport, Chicago, plans rebuilding hangar unit, with repair facilities, recently destroyed by fire, with loss of about \$30,000 including equipment.

Rowe Mfg. Co., Galesburg, Ill., manufacturer of ladders, farm implements, etc., is considering plans for rebuilding one and two-story plant recently destroyed by fire, with loss of about \$60,000 including equipment.

Bernstein Brothers Iron & Metal Co., 164 North Mechanic Street, Denver, is planning one-story storage and distributing plant, to cost about \$25,000 with equipment.

Bureau of Reclamation, Denver, will receive bids until March 4 for construction of Hoover dam and hydroelectric power plant on Colorado River, Boulder Canyon project, Arizona-California-Nevada. Work will include 16,250,000 net tons large metal conduits, 5,300,000 tons structural steel, and 10,000,000 tons of gates, hoists and other work, as per specification 519. Entire project will cost over \$100,000,000.

Adelbert E. Coleman, Chicago, operating an ornamental iron and metal works at 336 West Thirty-seventh Street, has arranged for change in name to Coleman Bronze Co.

International Rubber Co., Denver, manufacturer of tires and other rubber products, is considering construction of new plant at Pueblo, Colo., where property was recently acquired, to cost over \$75,000 with equipment. Present works at Denver will be removed to new location, and capacity increased.

Northland Milk Co., East Des Moines, Iowa, has authorized plant expansion and improvements to cost about \$50,000, including installation of bottling machinery, bottle-washing equipment, mechanical-handling equipment, boiler, oil burners and other equipment.

Bayne Culvert Co., Quincy, Ill., recently organized by George G. Bayne, Quincy, and associates, has leased property at Second and Jersey Streets for production of iron and steel culverts, flood gates and kindred heavy metal products. It is proposed to have plant ready

for service in about 60 days. Mr. Bayne will head new company. Louis H. Menne, Quincy, is interested in organization.

Midland Specialties Co., Chicago, has placed a contract with Austin Co., Cleveland, for a new one-story plant, 84 x 130 ft., on South Richmond Street, for manufacture of oil measures and funnels.

Illinois Iron & Bolt Co., Carpentersville, Ill., has purchased Bateman Bros. Inc., Poughkeepsie, N. Y., manufacturer of cutting parts for harvesting binders and reapers. Bateman plant will be continued in operation.

Duluth, South Shore & Atlantic Railway Co., 602 West Superior Street, Duluth, Minn., contemplates construction of new electrically operated ore dock, 82 ft. high, with 150 ore pockets, costing \$1,800,000, as replacement of present dock at Marquette, Mich.

State Line Generating Co., State Line, Ill., has taken out a permit for a \$2,000,000 addition to its generating plant.

## Cincinnati

**A**UTOMATIC bottling machinery, conveying and other mechanical-handling equipment will be installed in new three-story plant, 100 x 100 ft., to be built by W. T. Wagner's Sons Co., 1924 Race Street, Cincinnati, producer of artificial mineral waters, to cost over \$100,000 with equipment. Gustav Drach, Inc., Union Trust Building, is architect; Carl J. Klefer, Schmidt Building, is engineer.

Union Reduction Co., Queen City Street and Baltimore & Ohio Railroad, Cincinnati, is planning to rebuild part of engine department and water-softening plant recently destroyed by fire, with loss about \$30,000.

P. M. Elliott and Stuart R. Bolin, 1205 Beggs Building, Columbus, Ohio, have organized Elliott Condenser Valve Corp., and will operate local plant for manufacture of valves and kindred specialties. W. L. Kline and A. C. Lomier are interested in new company.

Contracting Officer, Wright Field, Dayton, Ohio, is asking bids until Jan. 12 for 530 wheel and brake assemblies; until Jan. 13 for 80,000 hose clamps, strip and sheet steel, carbon steel angle iron and galvanized sheet iron; until Jan. 19 for chrome nickel steel tubing and 385 gun control switch assemblies; until Jan. 20 for conduit, outlet boxes, fuses, cutouts and other electrical supplies.

Plans are under way by War Department, Washington, for removal of army air corps technical school from Chanute Field, Rantoul, Ill., to Wright Field, Dayton, Ohio, where increased facilities will be provided to house additional unit. With this transfer, Wright Field will be center of five principal divisions of air corps, including engineering school, engineering laboratories, technical school, material division, and equipment and supply division.

Kentucky Natural Gas Co., 423 West Third Street, Owensboro, Ky., an interest of Missouri-Kansas Pipe Line Co., Kansas City, Mo., is planning extensions in natural gas pipe lines in western part of Kentucky, including booster stations and other operating facilities.

Memphis Power & Light Co., Memphis, Tenn., is planning construction of steel tower transmission line over Mississippi River and extending to Wyanoka, Ark., where connection will be made with sys-

tem of Arkansas Power & Light Co., to cost over \$200,000.

Board of Education, Delaware, Ohio, is considering installation of manual training equipment in new three-story high school, to cost \$350,000, for which bids will be asked on general contract in March. T. D. McLaughlin & Associates, Lima, Ohio, are architects.

## Milwaukee

**B**IDS are being taken by Modine Mfg. Co., 1700 Racine Street, Racine, Wis., manufacturer of gas engine radiators, unit heaters, etc., for a \$75,000 plant addition, 80 x 110 ft., four stories. M. S. Potter is general manager.

Transformer Converter Co., Wisconsin Rapids, Wis., has been organized by I. W. Kureth and H. E. Patrick, formerly of Chicago, and W. F. Anderson, local industrialist, to manufacture a transformer converter type electric arc-welding unit. Plans for production are being completed.

Walsman Scrap Iron Co., 1116 Frederick Street, Racine, Wis., has started work on a new warehouse, 60 x 50 ft., one-story, to replace unit burned recently.

Eau Claire Airways, Inc., 148 Marston Street, Eau Claire, Wis., has placed contract for new steel hangar, 74 x 80 ft., with Eslin Co., Summit Avenue, Eau Claire, Wis.

Hamilton Metalplane Division of Boeing Airplane Co., is transferring entire operation from West Bruce Street plant to new hangar-shop at Milwaukee County Airport. Manufacturing will be confined to orders as received, but complete service shop for Hamilton planes and Hamilton-Standard propellers will be maintained. James G. Cowling, Jr., is Milwaukee manager.

Fire-Foe, Inc., Milwaukee, has been organized by O. R. Erwin and associates and has opened a plant at 5215 Mitchell Street, Milwaukee, for production of a new type of small fire extinguisher. An initial production of 100,000 units is planned for 1931. Most of equipment has been purchased.

## Detroit

**P**LANS are being completed by Baraga County Light & Power Commission, Baraga, Mich., for hydroelectric power plant on Sturgeon River, about seven miles from city, to cost over \$250,000 with transmission lines. Two waterwheel generating units will be installed. Holland, Ackerman & Holland, 20 North Wacker Drive, Chicago, are engineers.

Oscar B. Mueller, 1925 Lapeer Avenue, Port Huron, Mich., and associates have organized Mueller Streamline Copper Pipe & Fittings Corp., and plan operation of local factory for production of pipe, rods, fittings, tools and kindred specialties. Fred L. Riggan, Port Huron, is interested in new company.

Detroit Edison Co., 2000 Second Avenue, Detroit, has arranged fund of \$116,000 for extensions and improvements in plant and system near Mount Clemens, Mich., including transmission line construction. Company engineering department is in charge.

Detroit Gray Iron Foundry Co., 6403 Wight Street, Detroit, contemplates a one-story addition to foundry, to cost over \$25,000 with equipment.

Oliver Cadillac Co., Pontiac, Mich., local representative for Cadillac automobile, has awarded general contract to Pryale Construction Co., Pontiac, for two-story service, repair and sales building, to cost close to \$100,000 with equipment. W. C. Zimmerman, Pontiac, is architect.

Ford Motor Co., Dearborn, Mich., has asked bids on general contract for an addition to steel mill, including new mixer and furnace unit, to cost over \$100,000 with equipment. Giffels & Vallet, Marquette Building, Detroit, are engineers.

Precision Parts Co., Ypsi-Ann Building, Ann Arbor, Mich., recently organized by Charles A. Verschoor and associates, plans operation of local factory for production of automotive parts and other precision equipment. M. J. McCarthy, Ann Arbor, and Clarence E. Gittins, Highland Park, Detroit, are interested in new company.

Homer Furnace Co., Coldwater, Mich., has changed its name to Homer Furnace & Foundry Corp.

General Motors Corp. has commenced erection of a \$250,000 foundry for its Saginaw Malleable Iron Division, Saginaw, Mich. Structure will be 68 x 512 ft. Plant will make malleable castings for Chevrolet cars. Austin Co., Cleveland, has building contract.

Diamond Machine Co., Providence, R. I., has appointed Motch & Merryweather Machinery Co., 2842 West Grand Boulevard, Detroit, as its agent in that district.

Woodmere Scrap Iron & Metal Co., 9101 West Fort Street, Detroit, has purchased entire system of Toledo, Bowling Green & Southern Traction Co., including overhead and rolling stock equipment. This line runs from Toledo to Findlay, Ohio. Work of demolition will commence immediately.

## Pittsburgh

**B**IDS have been asked on general contract by Baker-Finley Chemical Co., 1426 West Third Street, Cleveland, manufacturer of industrial chemicals, etc., for one-story plant, 40 x 150 ft., at Vandergrift, Pa., to cost about \$40,000 with equipment.

Penn Central Light & Power Co., Altoona, Pa., is arranging for purchase of Blain Light, Heat & Power Co., Blain, Perry County, and will consolidate with organization. Purchasing company plans expansion in district noted, including transmission lines.

Hugh J. Hogan, Rochester, Pa., and associates have organized Rochester Machine Co., with capital of \$30,000, and plan operation of local factory for production of machinery and metal products, also engines and equipment. Others interested in company are R. F. Hogan and Leon R. Allman, Rochester.

Continental Fireworks Co., Dunbar, Pa., has acquired 230 acres at Mount Bradock, Pa., as site for new plant, to cost close to \$40,000 with equipment. Present works will be removed to new location.

Gulf Refining Co., Frick Annex, Pittsburgh, has applied for permission to construct a floating dock on Allegheny River at Kittanning, Pa., and will provide pipe lines and other equipment for loading and unloading oil tank barges.

Board of Public Education, Administration Building, Pittsburgh, will receive bids until Jan. 14 for babbittting and

boring machinery for Clifford B. Connally trade school, as per specifications on file.

## Indiana

**A**RRANGEMENTS have been made by Aladdin Mfg. Co., Muncie, manufacturer of lighting equipment, lamps, etc., for purchase of plant and business of Hamilton-Ross Factories, Inc., manufacturer of kindred equipment. It is proposed to continue production of Hamilton-Ross company at present location, and later develop expansion.

Trafalgar Canning Co., Trafalgar, is considering rebuilding part of local canning plant recently destroyed by fire, with loss at close to \$50,000 including equipment.

Stutz Motor Car Co., 1102 North Capitol Avenue, Indianapolis, has arranged for a fund of about \$1,000,000, secured through security issue, part to be used for expansion and development of plant and production facilities. E. S. Gorrell is president.

E. C. Atkins & Co., 402 South Illinois Street, Indianapolis, manufacturers of saws and kindred tools, have arranged for purchase of plant and business of Shurly-Dietrich Co., Ltd., Galt, Ont., manufacturer of similar products, and will consolidate with its Canadian E. C. Atkins & Co., Hamilton, Ont. Expansion is planned later, including removal of Hamilton plant to Galt.

B. Walter & Co., Inc., Wabash, has been organized to take over and expand company of same name, with local plant for manufacture of tables, table tops and kindred products.

W. J. Holliday & Co., Indianapolis, has started erection of first unit, 220 x 219 ft., of its plant at Hammond. Company will also use for warehouse and manufacturing purposes buildings formerly occupied by Illinois Car Mfg. Co.

## St. Louis

**P**LANS have been completed by William S. Frank, 4540 Parkview Street, St. Louis, architect, for automobile service, repair and garage building, to be occupied under lease by American Railway Express Co., 1730 Clark Avenue, to cost \$150,000 with equipment. T. J. Craven Engineering Co., Century Building, is engineer.

City Council, Hominy, Okla., has been authorized to issue bonds for \$150,000, proceeds to be used for a municipal electric light and power plant. V. V. Long & Co., Colcord Building, Oklahoma City, Okla., are engineers.

National Air Transport Co., Inc., 5936 North Cicero Street, Chicago, has plans for one-story hangar at municipal airport at Kansas City, Mo., with reconditioning and repair facilities, 120 x 120 ft., and 25-ft. lean-to extension, to cost over \$80,000 with equipment. R. H. Higgins, address noted, is company engineer.

Scales Brothers Handle Co., Eagle Mills, Ark., is planning new one-story factory, to cost about \$25,000 with equipment. E. N. and E. W. Scales are heads.

W. H. Emerson, Manhattan, Kan., is at head of a project to erect a local cold storage and refrigerating plant, consisting of three one-story units, 50 x 130 ft., and smaller, with facilities for 125 railroad cars at one time, to cost over \$85,000 with machinery.

Banfield Brothers Packing Co., Tulsa, Okla., meat packer, has plans by Bonnell-Tohtz Co., 1515 North Grand Boulevard, St. Louis, architect and engineer, for new packing plant at Fort Smith, Ark., with mechanical-handling and other equipment to cost about \$75,000.

Ozarka Water Co., 215 South Washington Street, Wichita, Kan., has awarded general contract to C. N. Startzman, 405 North Spruce Street, for one-story and basement bottling plant, 50 x 110 ft., to cost about \$45,000. Conveying and other mechanical-handling equipment, and automatic bottling machinery will be installed.

City Council, Independence, Mo., has plans for extensions and improvements in municipal electric light and power plant, including installation of a turbine unit and accessory equipment. Black & Veatch, Mutual Building, Kansas City, Mo., are consulting engineers.

Board of Education, Duncan, Okla., has plans under way for new high school to cost \$180,000, and contemplates installation of manual training equipment. C. P. Davis is president of board, in charge.

Dayson Petroleum Co., Smackover, Ark., is planning new oil refinery on local site, with power house, to cost about \$100,000 including equipment. Sylvester Dayson is president.

Curtiss-Wright Airplane Co., Lambert-St. Louis Field, recently received an order for 12 Kingbird transport planes for Eastern Air Transport, Inc., and one for United States Marine Corps for transport and ambulance service, representing more than \$250,000 worth of business.

Topeka Foundry & Iron Works, Topeka, Kan., has started work on an addition to its foundry.

## Gulf States

**A**N appropriation of \$900,000 is being arranged by San Antonio Public Service Co., San Antonio, Tex., for extensions and improvements in power plants and system during 1931, including equipment installation. Company engineering department will be in charge.

San Antonio Independent School District, San Antonio, Tex., has voted bonds for \$1,750,000 for school building program, including new senior high school to cost \$750,000, and junior high school to cost \$200,000, and plans installation of manual training equipment in both structures. Phelps & Dewees, Gunter Building, are architects.

City Council, Beaumont, Tex., has plans for a municipal airport, including hangars with repair and reconditioning facilities and other units, to cost about \$80,000. Irby & Woodside, 1020 Beaumont Street, are architects and engineers.

Gulf States Paper Corp., Tuscaloosa, Ala., is considering concentration of production at local mill and will remove its paper and pulp mill at Braithwaite, La., to Tuscaloosa. Paper bag-manufacturing plant at New Orleans will also be transferred to Tuscaloosa.

El Paso Electric Co., El Paso, Tex., is considering extensions and improvements in power plant and system during 1931 to cost about \$260,000, including installation of equipment. Company engineering department is in charge.

Denison Sash & Door Co., Denison, Tex., has plans for new one-story mill-work factory, to cost close to \$30,000 with equipment.

Municipal Park and Recreation Board,

Birmingham, has awarded general contract to A. J. Honeycutt Co., 2512 Eighth Court, North, for terminal building and hangar, with repair and reconditioning facilities, at municipal airport, to cost over \$100,000 with equipment. E. W. Stanford, Martin Building, is architect.

Houston Gulf Gas Co., Houston, Tex., operating natural gas properties, has arranged for an increase in capital from \$2,500,000 to \$10,000,000, part of fund to be used for expansion and improvements in pipe line properties. Company is affiliated with Electric Bond & Share Co., 2 Rector Street, New York.

Construction quartermaster, United States Army, Randolph Field, about 14 miles from San Antonio, Tex., is asking bids until Jan. 16 for an electric power substation and gas meter house at Randolph Field.

Birmingham Water Co., Birmingham, is considering addition to pumping plant on Cahaba River, including installation of pressure boiler with accessories, pumping machinery and auxiliary equipment, to cost \$100,000.

Southern Railway Co., New Orleans, has begun erection of new automatic unloading terminal at Chalmette, near New Orleans, to include installation of elevating, conveying and other mechanical-handling equipment to cost \$250,000.

Texas Cities Gas Co., El Paso, Tex., is planning expansion and improvements in gas plants and system during 1931, to cost about \$100,000 with equipment.

Birmingham Slag Co., Birmingham, Ala., has placed order with Ingalls Iron Works for 200 tons of structural steel to be used in rebuilding tipple and screening plant at Ensley which was destroyed by fire several weeks ago. The new plant will have capacity of 2000 tons a day.

## Pacific Coast

**A**PROPRIETION of \$188,000 has been authorized by Pacific Gas & Electric Co., 245 Market Street, San Francisco, for extensions and improvements in transmission system and plant at St. Helena, Napa County, and vicinity, including installation of additional equipment. Company will also make improvements in power substation at Healdsburg, Cal., to cost about \$30,000 including equipment.

Standard Gypsum Co., Long Beach, Cal., is considering expansion and improvements at plant, including additional units and installation of equipment, to cost over \$90,000. Festus T. McDonough is manager.

United Furnace & Foundry Co., Inc., Los Angeles, care of Francis B. Cobb, 623 Subway Terminal Building, recently organized with capital of \$25,000, plans operation of local foundry for production of iron and other metal castings. New company is headed by A. J. Hartfield, J. A. Martin and A. J. Braash.

Southern California Edison Co., Third Street and Broadway, Los Angeles, has plans for a new power substation and extensions in transmission lines at Costa Mesa, Cal., to cost about \$100,000 with equipment. Company engineering department is in charge.

San Diego Consolidated Gas & Electric Co., San Diego, Cal., will dispose of a note issue to total \$1,500,000, part of fund to be used for extensions and improvements in plant and system, including transmission lines.

Redwood Mfg. Co., Pittsburg, Cal., is planning to rebuild part of power plant

recently destroyed by fire, with loss about \$70,000 including equipment.

Carbon Dioxide & Chemical Co., Price, Utah, Frank Goodwin, vice-president, is considering plans for new one-story works on local site, to cost over \$75,000 with machinery. A similar plant is contemplated at Wellington, Utah, to cost close to a like sum.

Southern Sierras Power Co., Riverside, Cal., has purchased plant and property of Parker Electric Co., Parker, Ariz., and will consolidate. Plans are under way for expansion and betterments in Parker district, including a transmission line from Blythe, Cal., to that place, about 40 miles, to cost over \$125,000 with equipment.

Analy Union High School District, Sebastopol, Cal., plans erection of one-story vocational school in connection with a new high school group to cost about \$250,000. Davis-Pearce Co., Grant and Weber Streets, Stockton, Cal., is architect.

Coast Brush Mfg. Co., 1347 Tacoma Avenue, Tacoma, Wash., has plans for a new one-story factory, 100 x 115 ft., to cost about \$30,000 with equipment.

Twin Harbors Electric Co., Aberdeen, Wash., is planning expansion and improvements for service at Westport, Westhaven, Markham and vicinity, including transmission lines, to cost about \$70,000. Company engineering department is in charge.

An addition costing \$250,000 will be erected to Ontario, Cal., plant of Edison General Electric Appliance Co., for manufacture of Hot Point electric stoves and ranges.

## Canada

**B**IDS will be called about Jan. 10 by Albert Kahn, architect, Marquette Building, Detroit, for erection of a power plant for Kellogg Co. of Canada, Ltd., Dundas Street East, London, Ont., to cost \$75,000.

Ford Motor Co. of Canada, Ltd., Walkerville, Ont., is contemplating erection of a factory at East Windsor, Ont. F. Porter is chief engineer.

Guide Motor Mfg. Co., Ltd., 105 Sherbourne Street, Toronto, is considering erection of a plant addition during the early part of this year.

Additional contracts have just been awarded for a \$200,000 plant addition at Montreal for Crane, Ltd., 1170 Beaver Hall Hill. United Engineers & Contractors (Canada), Ltd., 1010 St. Catharine Street West, Montreal, has general contract.

E. R. Deveau, Salmon River, Lake Doucet, N. S., has started erection of a sawmill. Equipment will be purchased.

## Foreign

**P**LANS are under way by International General Electric Co., 120 Broadway, New York, an interest of General Electric Co., Schenectady, N. Y., and Tokyo Electric Co., Tokyo, Japan, for joint construction of new plant at Dairen, South Manchuria, China, for manufacture of electric lamps, to cost over \$1,000,000 with machinery.

Ford Motor Co., Dearborn, Mich., is considering new assembling plant at Kaiseraugst, near Basel, Germany, to cost over \$700,000 with equipment. Project will be carried out under direction of Ford Co. of Germany, Berlin.

Underwood Elliott Fisher Co., 342 Madison Avenue, New York, manufacturer of typewriters, bookkeeping and calculating machinery, parts, etc., has secured a substantial interest in Mercedes-Buromaschinen-Werke Aktiengesellschaft, Berlin, Germany, manufacturer of kindred equipment and will manufacture its patented machines in that country through such organization. Mercedes organization will arrange plant facilities for production of additional types of calculating and other machines.

Officials of Krupp Grusonwerk, Magdeburg, Germany, manufacturer of iron and steel products, are planning organization of a Canadian subsidiary under name of Canadian Krupps, Ltd., to establish a plant near Montreal for manufacture of mining machinery, agricultural implements and kindred products. Dr. Rudolph Wunsch, one of heads of com-

pany, is now in Canada selecting a site.

International Co., Ltd., has been formed by officials of Standard Oil Co. of New Jersey, Inc., 26 Broadway, New York, to take over and consolidate all foreign subsidiaries of company, including 17 European companies, operating oil properties, tankers and other floating equipment, pipe lines, etc. New organization will carry out development program in different districts and will establish headquarters at Liechtenstein, a principality between Switzerland and Germany.

Southern Cities Utilities Co., a subsidiary of Central Public Service Corp., 105 West Adams Street, Chicago, will carry out expansion at recently acquired electric properties at Port-au-Prince, Haiti, including extension in steam-operated electric power plant, to cost over \$400,000.

## New Capacity and Equipment in Steel Foundries

**I**NCREASE in capacity and additions to equipment of American steel foundries during 1930, with some plans for the future, which were crowded out of the Annual Review Number, are as follows:

General Steel Castings Corporation, Eddystone, Pa., completed last year the construction of its \$13,000,000 new plant and poured its first heat early in July. The capacity of the plant is over 5000 tons of steel castings per month. Three 50-ton basic open-hearth furnaces were completed, two of which will normally be operated continuously. The principal product of the plant will be foundation castings for locomotives, tenders, oil tank cars and similar equipment, together with miscellaneous castings of all kinds. Descriptions of features of this plant, which are outstanding, will soon be described in *The Iron Age*.

Lebanon Steel Foundry, Lebanon, Pa., built a new foundry last year which augments the capacity of its old plant for making electric steel castings. This was described in *THE IRON AGE*, Dec. 4. The company has also added a special alloy steel castings department in which it has two Ajax-Northrup high-frequency furnaces.

National-Erie Co., Erie, Pa., completed last year a heat-treating department 40 ft. by 140 ft. equipped with four furnaces and various other heat-treating equipment. There has also been installed and put in operation a 5-ton electric furnace.

Detroit Steel Casting Co., Detroit, last year constructed a new laboratory for chemical, physical, heat-treating and microscopic work in connection with the production of steel and the handling of molding sand. It has also completed a mechanically operated car-type annealing furnace with a cooling chamber for the annealing and heat treatment of carbon and alloy steel castings.

Riverside Steel Casting Co., Newark, N. J., last year built an extension of 85 ft. to its main building to provide more floor space for its molding department and for the storage of flasks under cover. There has also been installed a new drying oven, a new unit in one section of the foundry for multiple production of molding machines and a roller conveyor system, a sand reclaiming unit and a

complete laboratory for both chemical and physical control of its product.

Atlas Steel Casting Co., Buffalo, last year installed a 3-ton Moore electric furnace. It also built an addition to its finishing building and installed additional molding machines and other equipment. The entire plant has been equipped with an automatic sprinkler system. During 1931 the company plans an addition to its foundry building and the installation of considerable foundry equipment.

Industrial Steel Casting Co., Toledo, Ohio, last year added a gas-fired heat-treating furnace with a capacity for heating approximately 12 tons at one time and a motor generator set consisting of a 150-hp., 6900-volt, 60-cycle synchronous motor and a 100-kw. generator. A 12-kva., 6900-volt, 60-cycle transformer was purchased and one 3-ton electric melting furnace was scrapped. The company expects to replace this later with a 3-ton electric melting furnace of probably 1800-kva. capacity. This company also installed a sand handling and conditioning plant with a capacity of 6 tons per hr. and added a microphotographic and a physical laboratory.

The Ohio Steel Foundry Co., Lima, Ohio, during the year installed a 15-ton acid open-hearth furnace in its foundry at Bay City, Mich., which was formerly the steel foundry division of the Industrial Brownhoist Corp. This foundry was formerly operated under the converter process.

Fort Pitt Steel Casting Co., McKeesport, Pa., last year, extended its pattern shop and storage facilities; installed three furnaces for special heat treatment of castings, and sand conveying machinery for filling flasks.

The Bosshardt Steel Corporation, Canton, Ohio, expects to put in production by March 1, this year, two small Bosshardt open-hearth furnaces, having a capacity of 6000 tons per year. The company's program calls for the progressive building of these furnaces in pairs to a total of 12 furnaces. It is expected to have six furnaces in operation by the end of this year, having an approximate capacity of 18,000 tons of castings per year. The company intends to specialize in thin-section intricate steel castings.

Mesta Machine Co., West Homestead, Pa., added a building 60 x 300 ft. to its erection department.

The Harrison Steel Castings Co., Attica, Ind., last year built a machine shop and a storeroom unit.

# British Urged to Remove Handicaps in Struggle for World Trade

(By Cable)

LONDON, ENGLAND, Jan. 5.

**B**USINESS is still influenced by the holidays and year-end stocktaking. Pig iron users in districts other than Scotland point out that they must buy in the lowest priced markets and are urging Cleveland producers to reduce prices. Cleveland pig iron has been reduced 5s. (\$1.22).

Hematite iron prices are slightly easier with makers increasingly anxious to decrease stocks, which have been accumulated over the holidays. Consequently, £3 10s. (\$17) has been accepted on East Coast, mixed numbers.

Export of ferromanganese has been disorganized by the appearance of new Norwegian suppliers, believed to have Russian backing, who are keenly competing for contracts. British makers have found it necessary to accept £9 (\$43.74) per ton, f.o.b. from Belgian consumers. The price range for other markets is wide and generally nominal.

Finished steel is quiet, but sentiment is better, and Dorman, Long & Co. have secured a contract for the Tees bridge at £600,000 (\$2,916,000).

New shipbuilding is slow to develop and railway requirements are at a low ebb. Export trade is decidedly quiet.

The Continental market, both here and abroad, is inactive as a result of the holidays, and little change is ex-

pected before the end of the current week.

Foundry pig iron is steadier and there is possibility of improved basic pig iron demand if the South Wales coal strike is prolonged. Steel prices generally are unchanged.

Tin plate business is dull, with fair inquiry but little new buying.

The South Wales coal stoppage is not expected to influence prices greatly, unless it is unduly prolonged, as the tin plate mills are in possession of substantial fuel supplies with many mills idle under agreements for reduction of output.

Galvanized sheets are quiet. The Indian Tariff Board has struck another blow at British mills by recommending an additional import duty of

Indian Government increases duty on galvanized sheets.

\* \* \*

Norwegian ferromanganese interest reported to have Russian support.

\* \* \*

German steel manufacturer predicts early business improvement for United States, and British steel man suggests better business in second half.

\* \* \*

New aluminum-tungsten alloy being made in Germany is easily welded, forged or drawn.

37 rupees (\$13.32), making the total duty 67 rupees (\$24.12) a ton. The Indian Government concurs and the new tariff is provisionally effective from Dec. 29 to March 31, when the legislative assembly will be requested to prolong it until March, 1934.

Japan is inquiring for small lots of thin gage black sheets, and British makers have reduced prices in an effort to secure some business.

German, French and Belgian wire producers have agreed to a new schedule of export prices, f.o.b. Antwerp, as follows: Plain wire, £5 12½s. to £5 15s. (1.24c. to 1.27c. per lb.), annealed wire, £6 2½s. to £6 5s. (1.35c. to 1.38c. a lb.), galvanized wire, £7 to £7 2½s. (1.54c. to 1.57c. a lb.), barbed wire, £9 7½s. to £9 10s. (2.07c. to 2.10c.) and wire nails, £5 17½s. to £6 (\$1.29 to \$1.32 a keg).

The Darlington Rustless Steel & Iron Co. is erecting a new plant to manufacture stainless steel from chrome ore. William Beardmore & Co. will permanently close the steam locomotive department at Dalmuir when existing contracts have been completed.

At the annual meeting of Steel Industries of Great Britain, W. Benton Jones, chairman, stated that British industry is equally affected with others by the world-wide trade depression, which continues without evidence of business revival. He suggested that, as the depression has already lasted more than 12 months, from past ex-

## British and Continental European Export Prices per gross ton, f. o. b. United Kingdom Ports, Hamburg and Antwerp, with the £ at \$4.8665 (par)

### British Prices f. o. b. United Kingdom Ports

Ferromanganese, export	£9 0s.	to £11 5s.	\$42.74 to \$54.75
Billets, open-hearth	5 12½	to 6 5	27.34 to 30.41
Black sheets, Japanese specifications	11 10		55.95
Tin plate, per base box	0 15¾	to 0 16¼	3.83 to 3.92
Steel bars, open-hearth	7 15	to 8 5	1.69 to 1.79
Beams, open-hearth	7 7½	to 7 17½	1.60 to 1.71
Channels, open-hearth	7 12½	to 8 12½	1.66 to 1.87
Angles, open-hearth	7 7½	to 7 17½	1.60 to 1.71
Black sheets, No. 24 gage	9 0	to 9 5	1.95 to 2.01
Galvanized sheets, No. 24 gage	11 5		2.44

### Continental Prices, f. o. b. Antwerp or Hamburg

Foundry iron, 2.50 to 3.00 per cent sil., 1.00 per cent and more phosph.	£2 11s.	to £2 12s.	\$12.39 to \$12.64
--	---------	------------	--------------------

Billets, Thomas (nominal)	£2 14½s.	to £3 15s.	\$18.12 to \$18.24
Wire rods, low C., No. 5 B.W.G.	5 2½	to 5 7½	24.94 to 26.15
Rails, light	6 0		29.20
Black sheets, No. 31 gage, Japanese	11 5	to 12 12	54.68 to 58.32 Cents a lb.
Steel bars, merchant	4 7½	to 4 10	0.93 to 0.97
Beams, Thomas, British standard (nominal)	3 19	to 4 0	0.86 to 0.87
Channels, Thomas, American sections	5 12	to 5 14	1.24 to 1.26
Angles, Thomas, 4-in. and larger, over ¾-in. thick	4 2	to 4 3	0.88 to 0.89
Angles, Thomas, 3-in.	4 5	to 4 6	0.91 to 0.92
Hoop and strip steel over 6-in. base	4 12½	to 4 15	0.99 to 1.01
Wire, plain, No. 8 gage	5 12½	to 5 15	1.24 to 1.27
Wire, barbed, 4-pt. No. 12 B.W.G.	9 7½	to 9 10	2.08 to 2.09
Wire nails, base	5 17½	to 6 0	\$1.29 to \$1.30 a keg

perience we are justified in expecting a turn not to be delayed beyond the second half of 1931.

British industry, he said, is in addition handicapped in relation to other steel-producing countries, and the handicaps must be removed or counteracted before it can become prosperous. While British industry has stubbornly fought to maintain its share of trade, the cost of this fight has left it without profits, and with insufficient funds to equip itself to continue the struggle, even without return to its investors.

It is reported that the Krupp interests are planning to establish Canadian branches and that the Canadian railroads have agreed to purchase rails and machinery.

### Open-Hearth Steel Use Growing in Germany

HAMBURG, GERMANY, Dec. 24.—Most recent statistics show that about 30 per cent more open-hearth steel is being made in Germany than Thomas grade. Manufacturers of wire rope, fine wire mesh, music wire and other special wire products use open-hearth steel exclusively. For wire nails, fencing, baling, barbed wire, wire netting and ordinary commercial wire products, Bessemer steel has been found quite satisfactory and is used for about 98 per cent of the production.

### German Steel Head Sees Recovery in 1931

HAMBURG, GERMANY, Dec. 24.—Peter Klockner, head of the Klockner Steel Works, at a recent meeting of shareholders, stated that improvement in German business could not be expected before the end of the first half or early in the second half of 1931. The first six months of the year, he predicted, would bring a slow but steady improvement in export trade, and he said further that the United States would be the first country of the world to recover business prosperity in 1931. Herr Klockner's statements are especially significant when it is considered that he is recognized as one of the best economists in Germany, and foretold the present depression of German business almost a year before it developed.

Steel barrels shipped during November by members of the Steel Barrel Manufacturers Institute are reported at 308,120. Orders on hand on Dec. 1 called for 383,455 units, or somewhat more than a month's operations at the November rate. Capacity was engaged during the month to an average of 35.5 per cent, representing 21.7 per cent engagement of capacity for making I. C. C. barrels, and 39 per cent for light barrels. The volume of business during the month was \$734,243.

### Reparations Mostly in Steel and Machinery

HAMBURG, GERMANY, Dec. 24.—Deliveries on reparations have recently become largely iron, steel and machinery. In the past year shipments have averaged 61,000,000 m. (\$14,518,000) a month. November deliveries included 19,900,000 m. (\$4,736,000) of machinery, 16,800,000 m. (\$3,998,400) of iron, steel and hardware, 4,700,000 m. (\$1,113,000) of railroad cars, and 2,000,000 m. (\$476,000) of ships.

### German Tin Plate Export Steadily Increasing

HAMBURG, GERMANY, Dec. 24.—German tin plate production and export trade continue to show small but steady gain. Total exports of tin plate for 1930 are expected to be about 36,000 tons, compared with 30,100 tons in 1929 and 26,440 tons in 1928. Formerly German consumers imported about 2000 tons of Welsh tin plate a month, but in the past few months total imports have been only about 550 tons a month. Although German makers have been seeking a market for their tin plate in Japan, sales have consisted mostly of sample shipments. The greater part of German exports are to Portugal, Italy, Norway and Sweden.

### German Scrap Prices Down

HAMBURG, GERMANY, Dec. 24.—Prices of steel scrap are declining, recent reductions totaling about 2 m. (47c.) a ton. No. 1 heavy melting steel at Berlin is 30 m. (\$7.14) a metric ton. Turnings, delivered to plants in the Ruhr, are usually quoted at 28 m. (\$6.65) a ton.

### Mexico Inquires for Steel Mill Equipment

HAMBURG, GERMANY, Dec. 24.—Steel interests in Mexico are inquiring in Germany for steel plant equipment, especially machinery for production of sheets, plates and hoops. Builders of this equipment have quoted on some substantial business and expect orders to be placed shortly.

### Malleable Castings Orders and Production Lower

WASHINGTON, Jan. 6.—Orders for malleable castings last November totaled 27,187 net tons, or 27.7 per cent of capacity, against 24,171 tons, or 29 per cent of capacity, in October, according to reports received by the Bureau of the Census from 117 firms operating 131 plants. The November production was 26,873 tons, compared with 28,785 tons in October, and shipments totaled 25,747 and 29,206 tons, respectively.

Orders in the first 11 months of 1930 aggregated 449,128 tons, or 44.7 per cent of capacity, against 742,403 tons or 73.5 per cent of capacity, in the corresponding period of 1929.

Production totaled 484,331 tons in the first 11 months of last year, compared with 778,827 tons in the corresponding period of the preceding year, while shipments were 492,100 tons and 770,461 tons, respectively.

### New Aluminum-Tungsten Alloy in Germany

HAMBURG, GERMANY, Dec. 24.—A new alloy of aluminum, in which tungsten is used, is being produced commercially in Germany under the trade name of "Benit." The alloy consists of 96.91 per cent aluminum, 2 per cent copper, 0.45 per cent manganese and 0.27 per cent tungsten. It is claimed by the maker to be easily welded, forged and drawn, and has high tensile strength and hardness.

### Japanese Steel Works Curtails Output

YOKOHAMA, JAPAN, Dec. 6.—The Government Steel Works has curtailed its production schedule for the second time this year, reducing output of heavy rails 44 per cent, steel bars 51 to 53 per cent and heavy plates 70 per cent. The average monthly reduction in production will be 25,250 tons. About 1000 workmen have been put on part time work, but will receive about 50 per cent of the full wage for the days they are laid off.

### British Industries Fair to Be in Two Sections

The British Industries Fair will be held Feb. 16 to 27, 1931, in two sections, one at Olympia, London, and the other at Castle Bromwich, Birmingham, England.

Machinery, including machine tools, small tools, metals, testing equipment, foundry appliances and general hardware, will be shown for the most part at Birmingham. Admission cards to these fairs can be obtained from the British Consulate General, New York; possession of these cards enables visitors to have their passports viséed free.

### A Correction

On page 148 of the Annual Review Number of *THE IRON AGE*, Jan. 1, an error occurred in the table of unfilled orders of the United States Steel Corp. All of the figures for 1928 and 1929 are in incorrect order and January and February, 1930, have been reversed. Correct figures for all of these 26 months were published in *THE IRON AGE* of Dec. 25, 1930, page 1974.

## Machine Design Affected By New Cutting Material

*(Concluded from page 159)*

such as to permit use of a turret or some equivalent device which will present a series of cutting edges in the proper position relative to the work each time that a piece is machined, the problem can be solved by the adaptation of the turret or its equivalent to types of tools on which it has not yet been extensively used. Where this is not possible, we may expect to see the standardization of hardened and ground tool shanks, the development of fixtures or other methods for setting tool bits in accurate relation to these standardized shanks, and the equipment of tool heads with indexing devices of types now well known, and of holders for quickly receiving and rigidly holding in exact position, such standard shanks, so that cutting edges can be readily and accurately presented in desired relation to the work.

### Buy New Equipment With Eye to Future

With the foregoing thoughts in mind, the writer wishes to point out that at the present day new tools must be purchased with an eye to the future. They must be tools of a character which will fit into the needs of future development in the metal-working industry. They must have adequate power, speed and rigidity to utilize the super-hard cutting tools to advantage. They must have, in addition, those facilities which will enable the operator to cut down to a minimum the five terms which increase in importance when cutting time is reduced. Facilities which would be frills when the cutting time was 80 per cent of the total time are highly desirable when the cutting time is 50 per cent, and absolutely necessary for economical production when the cutting time becomes 30 per cent of the total time.

In any period of new developments in machine tool design, manufacturers are prone to put on the market designs which have sales appeal, but which do not have real production value. If a device enables an operator to save 3 sec. twice a day by pushing a button and doing something electrically which he could just as well do mechanically by giving a crank a few turns, there may be considerable sales appeal in the device, but it has no real value. It is possible that electrical troubles will, in the long run, more than compensate for the saving in time. If, however, some new development will save 30 sec. once an hour, the matter may be worth looking into, and if by some other development the hour can be cut to 20 min., the saving becomes a matter of 2½ per cent.

There is an old saying that "all is not gold that glitters" and neither are all "improvements" in machine-tool design of value to the machine-tool user. They must be studied, not from the standpoint of sales appeal, but from the standpoint of future utility as the art of metal working continues to develop.

In conclusion, the writer wishes to point out that in many cases the management of metal-working industries has been remiss in not providing suitable machinery, and developing such equipment as jigs, fixtures and shop furniture for the workmen. It has been still more remiss in not directing and assisting

the workmen in the development of new technique and methods of work. Most shops that have been in existence for any considerable period are equipped with many machine tools the design of which was out of date 20 years ago. Many shops established during and since the war are equipped with second-hand tools or cheap tools of models that are anything but efficient. If such shops do not voluntarily change their point of view, the pressure of new developments will inevitably force them out of business.

So long as cutting time was the principal element of cost, the machine tool purchaser had some measure of justification in leaving his problems up to the manufacturers of cutting tools and of machine tools. The writer believes that in the near future, cutting time will be so far decreased that the users of machine tools will be forced by economic pressure to give their best efforts to the solution of problems which they have hitherto neglected. Half-way measures in this regard will place them in the position of being marginal producers, likely to be forced out of business at any time by the pressure of men of courage, brains and initiative, who are willing to give to their problem the intense and constant study which modern conditions demand. Machine tools which cannot meet adequately modern conditions, methods, technique and processes of a bygone era, and minds attuned to the past rather than the future, will inevitably go the way of the mastodon and the dodo.

## Steel Warehouses Weather Depression

*(Concluded from page 169)*

districts. It applies principally to the heavy hot-rolled products and to blue annealed sheets and, with few exceptions, has been the means toward securing a larger margin of profit on these products.

The standard scale of cutting charges previously adopted by jobbers' committees was also further extended last year and in the past six months was effective in practically all the important distributing centers throughout the country. Long a troublesome problem, the applying of cutting charges has now been placed on a basis which brings a proper return to the jobber for his services and also enables the consumer to figure his costs with some certainty.

### Prices None Too Strong

Warehouse prices declined steadily throughout the year, and along with mill quotations reflected considerable weakness, particularly in the last half. Sheets and strip steel were most seriously affected, but jobbers were fairly successful in maintaining their margin of profit in most districts. Maintenance of minimum stocks mentioned heretofore was essential in this sort of a market. In a few territories shading of discounts on bolts and nuts became rather common although mill quotations were adhered to in most instances. The extreme lack of stability in nail and merchant wire prices was also seriously reflected in jobber sales and the practice followed by a few large jobbers in some territories of selling nails practically at cost in an effort to stimulate business in other lines was injurious to smaller sellers. Toward the end of the year, nails as well as other steel products apparently

## Business as Others See It

OLD lines of development, carrying industry from the slough of 1921 to the dizzy peaks of 1929, have been so thoroughly disrupted, says Brookmire Economic Service, as to make definite appraisal of the outlook difficult. Examining some of the principal lines of activity in detail, however, that organization concludes that "on the whole, business volumes and operations in 1931 will exceed 1930 little if at all. The general trend we expect to be moderately upward."

Automobile output is placed at about 4,000,000 units, vice 3,450,000 in 1930; building construction at \$4,100 millions, vice \$4,525 in 1930 and \$6,197 in 1929, and "a smaller proportion of the diminished construction will be in the heavy steel-consuming types"; steel output is estimated by Brookmire at about 38,000,000 tons for 1931, or 5 per cent below 1930.

### Considers Opportunities Excellent

OVER against this somewhat dismal survey we find *Business Week* saying: "Periods like this are times of opportunity which rarely occur more than once in a generation, and the only thing to fear is that we may let them slip by. . . . Never has it been more certain that those who invest

their energy and their capital in business enterprise are bound to reap their reward before they are too old to enjoy it."

Lower inventories are noted as a good sign by the Union Trust Co., Cleveland, which says that "the seeds of recovery have been definitely shown."

We are not yet around the corner, thinks Benjamin Baker in *Annalist*, and "definite signs of upturn are lacking." And one authority doubts whether spring will see a "material increase in demand for housing," which was said to have had a "quite burdensome surplus" a year ago, not yet entirely absorbed.

Business enters 1931 with commodity prices declining, activity very low and money rates extremely easy, according to Harvard Economic Society. That organization concludes that shrinkage in business activity has gone about as far in extent and duration as in former depressions. "Conditions of recovery are present. Such recovery, though it may be gradual, should commence, . . . probably before the end of the first quarter."

### Causes and Incidence of Wages

NOT a little searching for causes has been going forward. Guaranty Trust Co. of New York

### Digest of Current Financial and Economic Opinion

concludes that "depressions have their origins in the preceding periods of over-expansion and inflation falsely termed prosperity. Little progress can be made in avoiding these upheavals until business becomes sufficiently well organized, farsighted and wise to forego the tempting possibilities which always present themselves in prosperous times."

*Commerce and Finance* calls attention to the explosion of the old theory that wages derive from capital. "Wages are derived from production. But when production does not sell, what is to become of wages? . . . High wages have been relied on to maintain public buying power. . . . If wages (of hand and brain) be high enough, they could absorb all production. . . . As the world is economically organized today, it is not possible to raise and maintain wages at any such figure."

A quantitative measure of the depression, made by Alexander Hamilton Institute, includes the following: Checks cashed, 11 months, excluding New York City, dropped 16.7 per cent; manufacturing output now 35 per cent below 1929 peak; mining down 18 per cent from 1929 peak; freight car loadings down 16 per cent from one year ago.

achieved a semblance of stability and it is felt that the downward trend of prices has been checked.

Sales out of warehouse during 1930 declined from 20 to 50 per cent under 1929 levels, with an average loss of about 25 per cent. Considering the reduced activity in practically all lines of business, the showing was not so bad. A leading factor in the loss of business was the building industry, which in most branches continued very dull throughout the year. This stagnation was more keenly felt by jobbers than by mills as small and medium-sized projects were most conspicuously lacking. The aircraft industry also reduced its warehouse purchases of steel and other metal products materially. A great many of the smaller airplane manufacturers, most of them of recent origin, were either taken over by larger interests or went out of business during the year. The larger makers, who have continued to operate, generally buy most of their materials in sufficient volume to enter the lists of mill customers. The same situation existed in the radio industry, which has been deflated even more than the aircraft group. However, in many cases, these small companies had a doubtful credit rating and their business was not always of a desirable sort. Collections as a whole were difficult during the year and jobbers were forced to watch the matter of credit carefully.

Mergers were not nearly so common among jobbers as in previous years. The larger chains expanded only

in a very limited way and few consolidations of independent interests in the same area were reported. However, only a few distributers ceased to operate and the record of the year indicates that the warehouse industry had succeeded in establishing itself on a sound basis before the depression was felt.

While the warehouse business must naturally follow the general trend of the steel industry during the new year, its opportunities for an earlier return of increasing profits seems to be a trifle better. It seems reasonably certain that warehouses will be able to buy in either a rising or comparatively stable market over the great part of the year. While the temptation to buy ahead may be rather great, the more astute jobber will probably be content to assure himself of a fair margin of profit at all times rather than to seek excessive profits by speculative buying. Jobbers have been mentioned recently among buyers of steel who have sought to cover their needs for six months and even longer at present low price levels, but mills admit that the occasions are rare and that they have usually refused such long commitments.

Warehouse inventories are generally very low. While some restocking will have to take place in January, the average distributor will be able to adjust his needs closely with demand in direct contrast to the situation with which he was faced during the greater part of 1930.





# THE IRON AGE

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IRON AGE PUBLISHING CO.  
239 West 39th Street,  
New York, N. Y.

Cable Address: "Ironage, N. Y."  
F. J. FRANK, *President*  
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Division of  
UNITED BUSINESS PUBLISHERS, INC.  
New York, N. Y.

*District Offices:*  
CHICAGO, Otis Building  
PITTSBURGH, 1319 Park Building  
CLEVELAND, 1362 Hanna Building  
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IRON AGE PUBLISHING CO.  
Member, Audit Bureau of Circulations  
Member, Associated Business Papers  
Published every Thursday. Subscription Price: United States and  
Possessions, Mexico, Cuba, \$6.00;  
Canada, \$8.50; foreign, \$12.00 a  
year. Single Copy 25 cents.

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### How New Ideas Are Born

ACCORDING to the psychologists, no idea is ever entirely brand new. The brilliant thought that is going to throw competition into a panic is simply a piece of one old idea, buried in the memory, combined with a piece of another old idea.

New ideas are born of the clash of existing ideas. The more ideas fed into the brain, the greater the likelihood that some will come out. And the more brains they are fed into, the greater the possibility of your getting ideas that will revolutionize your business.

Therefore, see to it that THE IRON AGE, itself a veritable mine of ideas, is circulated among all in your organization whom you regard as potential sources for useful ideas. Don't let THE IRON AGE "die" on one man's desk. Route it systematically. Maybe an idea in this very issue will unite with an idea now in mind of someone in your organization and produce a conception that will have electrifying results.

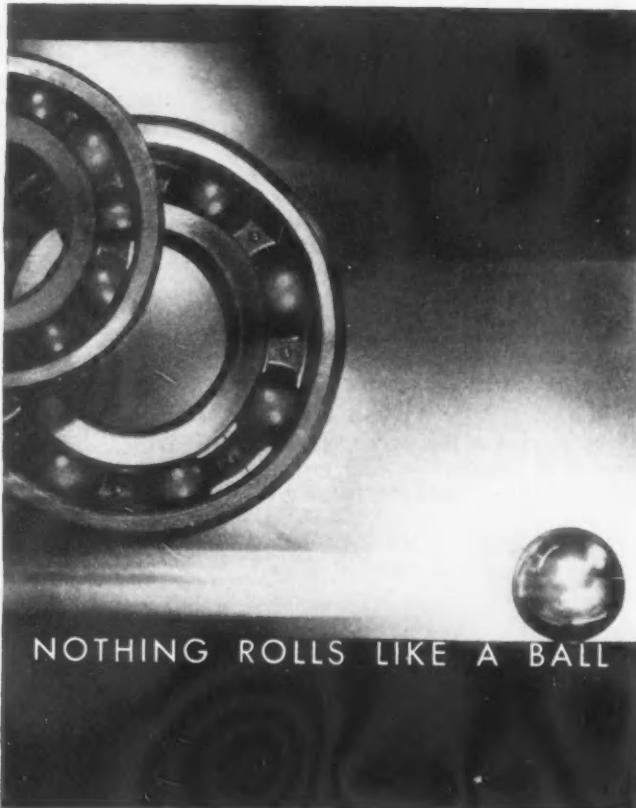
—A. H. D.



## NEW DEPARTURE BALL BEARINGS



### An invisible factor is reducing costs



in the plant of the Atlantic Wire Company.

Hidden away in motor housings are New Departure Ball Bearings . . . sturdily resisting wear . . . steadily reducing motor maintenance costs. The picture shows reel after reel of wire being drawn through reducing dies . . . by the power of a New Departure-equipped Westinghouse motor.

Your choice of New Departures is justified if only by this one fact . . . they need lubrication but once a year. The New Departure Mfg. Co., Bristol, Connecticut.

# THIS ISSUE IN BRIEF

January 15, 1931

## Post-Mortem Costs

Expensive cost system that revealed, *after* the job was completed, whether or not a profit had been made, is discarded by jobbing foundry. Cost estimate system now used tells, while the job is running, whether money is being made on it.—Page 227.

\* \* \*

## Why 1930 Was His Best Year

Careful planning to avoid idle machine time and excessive set-ups, a well-balanced bonus system, accurate costs and a good product are reasons given by stamping press manufacturer for record-breaking profits in 1930.—Page 224.

\* \* \*

## Explosion Hazard Eliminated

It is better to *draw* rather than *drive* cooling water through the inductor coil of coreless induction furnaces. In the event of a leak, no great amount of water will come into contact with the molten metal, if the water is under suction.—Page 231.

\* \* \*

## Industrial "Style in Methods"

A "style in methods" exists in all industries, says machinery builder, and it is continually changing. The manufacturer who becomes complacent quickly finds himself out of style.—Page 225.

## Unwieldy Big Companies

Beyond a certain point, concentrated production becomes unwieldy and is a distinct disadvantage in competition with smaller companies. Accordingly, decentralization is becoming increasingly popular.—Page 222.

\* \* \*

## Windowless Factories

Artificial illumination, ventilation and atmospheric control excel the effects of natural sunlight and air. The windowless factory is cheaper, safer from fire and provides greater wall space.—Page 234.

\* \* \*

## Factory Sand Control

Testing laboratory is placed directly over the sand conveyor belt. Man in charge makes frequent permeability and moisture determinations, in accordance with which he controls the wetting system of the tempering belt.—Page 241.

\* \* \*

## A Steel Casting for Jules Verne

Diving bell used by William Beebe for undersea exploration is a 5500-lb. steel casting. At 1400 ft. below the surface it withstands a pressure of 650 lb. per sq. in.—Page 242.

\* \* \*

## Squeezing Molten Ingots

Before the metal solidifies, the ingot mold is placed under a press. Bottom plate moves upward and forces the ingot into the tapered part of mold. Segregation is reduced.—Page 246.

\* \* \*

## Unemployment Suffering Worst in Highly Industrial Centers

Decentralization movement will be quickened by our experience during this present depression. Where industry is concentrated, unemployment conditions aggravated.—Page 221.

\* \* \*

## Hangars Will Require Much Steel

Large hangars are the order of the day. One just built in Burbank, Cal., took 500 tons of structural steel.—Page 244.

## A Refractory That Lasts

A good refractory for coreless induction furnaces is a very pure zirconium silicate sand. It has all the useful properties of silica sand and is much more refractory.—Page 231.

\* \* \*

## Make It Pay

A losing job is often changed into a paying job by making a slight change in the core boxes or a change of gating, or a different kind of molding machine, says jobbing foundry.—Page 227.

\* \* \*

## Distributing Production

Why not match distributed consumption with distributed production? Farsighted manufacturers with national distribution are decentralizing. Business hazards are reduced when production units are scattered.—Page 222.

\* \* \*

## Cuts Wages, Gets Business

At the beginning of the slump, Wisconsin jobbing foundry promptly cut wages and piece work rates. Has been able to get business and provide full-time employment ever since.—Page 227.

\* \* \*

## City Locations Are Expensive for Factories

No longer need the factory stay in the city. Electric power, motor truck transportation and autos and buses for workers, now permit the factory to locate in uncrowded areas.—Page 222.

## NEXT WEEK

How far has business readjustment gone? John H. Van Deventer, industrial consultant, THE IRON AGE, finds that statistically the domestic production - consumption equation is nearly balanced.

The foreman's responsibility in slack times, ways of controlling one's profit course in the coming year, and chromium plating of gages will be features.

THE  
J & L  
TANGENT  
DIE  
WITH  
GROUND  
THREAD  
CHASERS

FOR  
RAPID  
PRODUCTION  
OF  
ACCURATE  
SCREW  
THREADS

CAPACITY  
 $\frac{3}{8}''$  to  $\frac{3}{4}''$

THE COST PER SCREW  
WILL TELL THE STORY

JONES & LAMSON MACHINE COMPANY  
SPRINGFIELD, VERMONT